

Service Manual



# Service Manual

## KE970



Model : KE970



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## REVISED HISTORY

Editor	Date	Issue	Contents of Changes	S/W Version
G.C. LIM	2006/03/29	0.1		

\* The information in this manual is subject to change without notice and should not be construed as a commitment by LGE Inc. Furthermore, LGE Inc. reserves the right, without notice, to make changes to equipment design as advances in engineering and manufacturing methods warrant.

\* This manual provides the information necessary to install, program, operate and maintain the KE970.

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# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of the KE970.

## 1.2. Regulatory Information

### A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges you're your telecommunications services. System users are responsible for the security of own system.

There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. LGE does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. LGE will not be responsible for any charges that result from such unauthorized use.

### B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the KE970 or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### D. Maintenance Limitations

Maintenance limitations on the KE970 must be performed only at the LGE or its authorized agents. The user may not make any changes and/or repairs except as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

# 1. INTRODUCTION

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## **E. Notice of Radiated Emissions**

The KE970 complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## **F. Pictures**

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

## **G. Interference and Attenuation**

An KE970 may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

## **H. Electrostatic Sensitive Devices**

### **ATTENTION**

Boards, which contains Electrostatic Sensitive Device(ESD), are indicated by the sign.

Following information is ESD handling: Service personnel should ground themselves by using a wrist strap when exchange system boards.

When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded. Use a suitable, grounded soldering iron. Keep sensitive parts in these protective packages until these are used. When returning system boards or parts such as EEPROM to the factory, use the protective package as described.

### 1.3 ABBREVIATION

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Ratio
CC-CV	Constant Current - Constant Voltage
CLA	Cigar Lighter Adapter
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli-watt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
EL	Electroluminescence
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIB	General Purpose Interface Bus
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
LGE	LG Electronics



## 1. INTRODUCTION

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OPLL	Offset Phase Locked Loop
PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

## 2. PERFORMANCE

### 2.1 H/W Feature

Item	Feature	Comment
Standard Battery	Li-ion, 800mAh	
AVG TCVR Current	280mA	PL5
Standby Current	<2.7mA	@PP9
Talk time	3hours (GSM TX Level 7)	
Standby time	277 hours (Paging Period:9, RSSI: -85dBm)	
Charging time	3 hours	
RX Sensitivity	GSM900 : -105dBm, DCS/PCS : -105dBm	
TX output power	GSM900: 32dBm (Level 5) DCS/PCS: 29dBm (Level 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small	
Display	320 x 240 pixels, 2.2 inch wide, 265K color, TFT	
Status Indicator	Soft icons Key Pad 0 ~ 9, #, *, END/PWR, SEND, CLEAR Key Side Key Up/Down, AF/Camera double action key	
ANT	Built in antenna	
EAR Phone Jack	18pin multi port Headset jack with Remote controller	
PC Synchronization	Yes	
Speech coding	EFR/FR/AMR	
Data and Fax	Yes	
Vibrator	Yes	
Buzzer	No	
Voice Recoding	Yes	
C-Mic	Yes	
Receiver	Yes	
Travel Adapter	Yes	
Options	Bluetooth hands-free kit, Data Kit	

## 2. PERFORMANCE

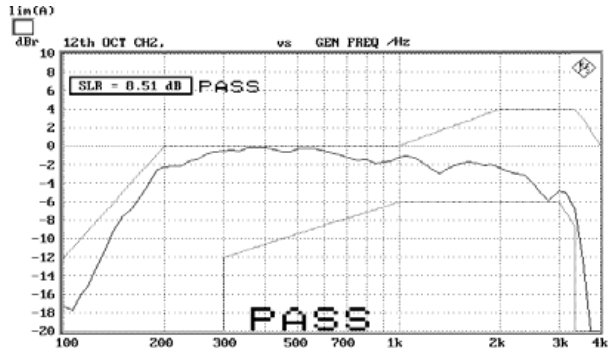
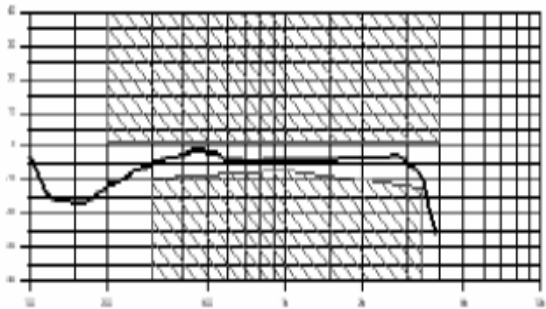
### 2.2 Technical specification

Item	Description	Specification					
1	Frequency Band	<b>GSM900</b> • TX: 890 + 0.2 x n MHz • RX: 935 + 0.2 x n MHz ( n = 1 ~ 124 ) <b>EGSM</b> • TX: 890 + 0.2 x (n-1024) MHz • RX: 935 + 0.2 x (n-1024) MHz ( n = 975 ~ 1023 ) <b>DCS1800</b> • TX: 1710 + ( n-511 ) x 0.2 MHz ( n = 512 ~ 885) • RX: TX + 95 MHz <b>PCS1900</b> • TX: 1850.2 + ( n-512 ) x 0.2 MHz ( n = 512 ~ 810) • RX: TX + 80MHz					
2	Phase Error	RMS < 5 degrees Peak < 20 degrees					
3	Frequency Error	< 0.1ppm					
4	Power Level	<b>GSM900/EGSM</b>					
		Level	Power	Toler.	Level	Power	Toler.
		5	33 dBm	±2dB	13	17 dBm	±3dB
		6	31 dBm	±3dB	14	15 dBm	±3dB
		7	29 dBm	±3dB	15	13 dBm	±3dB
		8	27 dBm	±3dB	16	11 dBm	±5dB
		9	25 dBm	±3dB	17	9 dBm	±5dB
		10	23 dBm	±3dB	18	7 dBm	±5dB
		11	21 dBm	±3dB	19	5 dBm	±5dB
		12	19 dBm	±3dB			
		<b>DCS1800/PCS1900</b>					
		Level	Power	Toler.	Level	Power	Toler.
		0	30 dBm	±2dB	8	14 dBm	±3dB
		1	28 dBm	±3dB	9	12 dBm	±4dB
		2	26 dBm	±3dB	10	10 dBm	±4dB
		3	24 dBm	±3dB	11	8 dBm	±4dB
		4	22 dBm	±3dB	12	6 dBm	±4dB
		5	20 dBm	±3dB	13	4 dBm	±4dB
		6	18 dBm	±3dB	14	2 dBm	±5dB
7	16 dBm	±3dB	15	0 dBm	±5dB		

## 2. PERFORMANCE

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	<b>GSM900/EGSM</b>	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-63
		3,000~ <6,000	-65
		6,000	-71
		<b>DCS1800/PCS1900</b>	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-65
		3,000~ <6,000	-65
		6,000	-73
6	Output RF Spectrum (due to switching transient)	<b>GSM850</b>	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-19
		600	-21
		1,200	-21
		1,800	-24

## 2. PERFORMANCE

Item	Description	Specification	
6	Output RF Spectrum (due to switching transient)	<b>DCS1800/PCS1900</b>	
		Offset from Carrier (kHz).	Max. (dBm)
		400	-22
		600	-24
		1,200	-24
		1,800	-27
7	Spurious Emissions	Conduction, Emission Status	
8	Bit Error Ratio	<b>GSM850</b> BER (Class II) < 2.439% @-102dBm	
		<b>DCS1800/PCS1900</b> BER (Class II) < 2.439% @-100dBm	
9	Rx Level Report accuracy	$\pm 3$ dB	
10	SLR	$8 \pm 3$ dB	
11	Sending Response		
12	RLR	$-15 \pm 3$ dB	
13	Receiving Response		
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.	

## 2. PERFORMANCE

Item	Description	Specification	
14	STMR	> 17 dB	
15	Stability Margin	> 40 dB	
16	Idle Noise Sending	< -64dB	
17	Idle Noise Receiving	< -47dB	
18	Side tone Distortion	Three stage distortion < 10%	
19	<Change> System frequency (26 MHz) tolerance	$\leq 2.5\text{ppm}$	
20	<Change>32.768KHz tolerance	$\leq 30\text{ppm}$	
21	Power consumption	Standby - Normal $\leq 5.2\text{mA}$ (Mix. power)	
22	Talk Time	GSM900/Lvl 7(Battery Capacity 800mA) : Min. 2.5 hr GSM900/Lvl 12(Battery Capacity 800 mA) : Min. 3hr	
23	Standby Time	Under conditions, at least Min. 250 hr 1. Brand new and full 800mAh battery 2. Full charge, no receive/send and keep GSM in idle mode. 3. Broadcast set off. 4. Signal strength display set at 3 level above. 5. Backlight of phone set off.	
24	Ringer Volume	At least 65 dB under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm	
25	Charge Voltage	Fast Charge : < 450 mA Slow Charge: < 55mA	
26	Antenna Display	Antenna Bar Number	Power
		5	-85 dBm ~
		4	-90 dBm ~ -86 dBm
		3	-95 dBm ~ -91 dBm
		2	-100 dBm ~ -96 dBm
		1	-105 dBm ~ -101 dBm
		0	~ -105 dBm

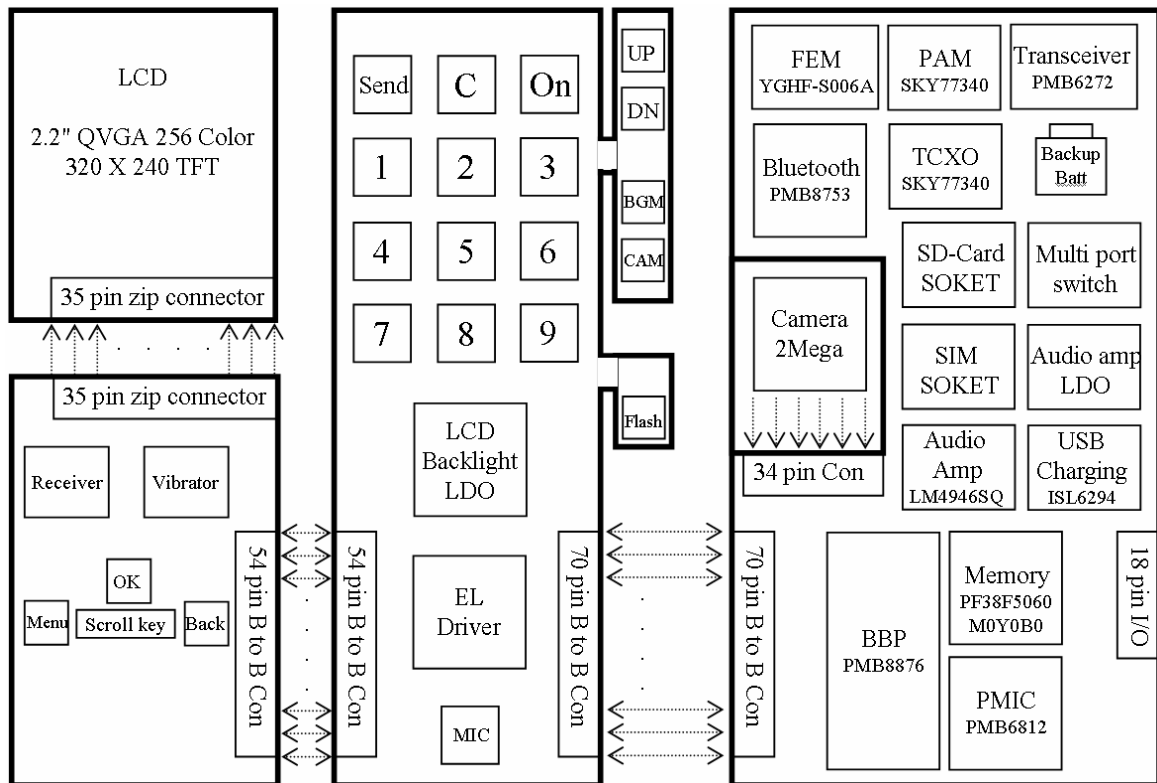
## 2. PERFORMANCE

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Item	Description	Specification	
27	Battery Indicator	Battery Bar Number	Voltage( $\pm 0.05V$ )
		4	3.86V~4.2V
		3	3.75V~3.85V
		2	3.75V~3.69V
		1	3.69V~3.62V
		0	3.62V~
28	Low Voltage Warning	3.62V↓ $\pm 0.05V$ (Call)	
		3.50V↓ $\pm 0.05V$ (Standby)	
29	Forced shut down Voltage	3.35± 0.05 V	
30	Battery Type	1 Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 800mAh	
31	Travel Charger	Switching-mode charger Input: 100 ~ 240 V, 50/60Hz Out put: 4.8, 0.9A	

### 3. TECHNICAL BRIEF

#### 3.1. KE970 Component Block diagram.



**Figure 1. KE970 Hardware architecture**

KE970 is composed with 3 different PCB part such as main PCB, keypad FPCB and slide FPCB.



### 3. TECHNICAL BRIEF

#### 3.2. Baseband Processor (BBP) Introduction

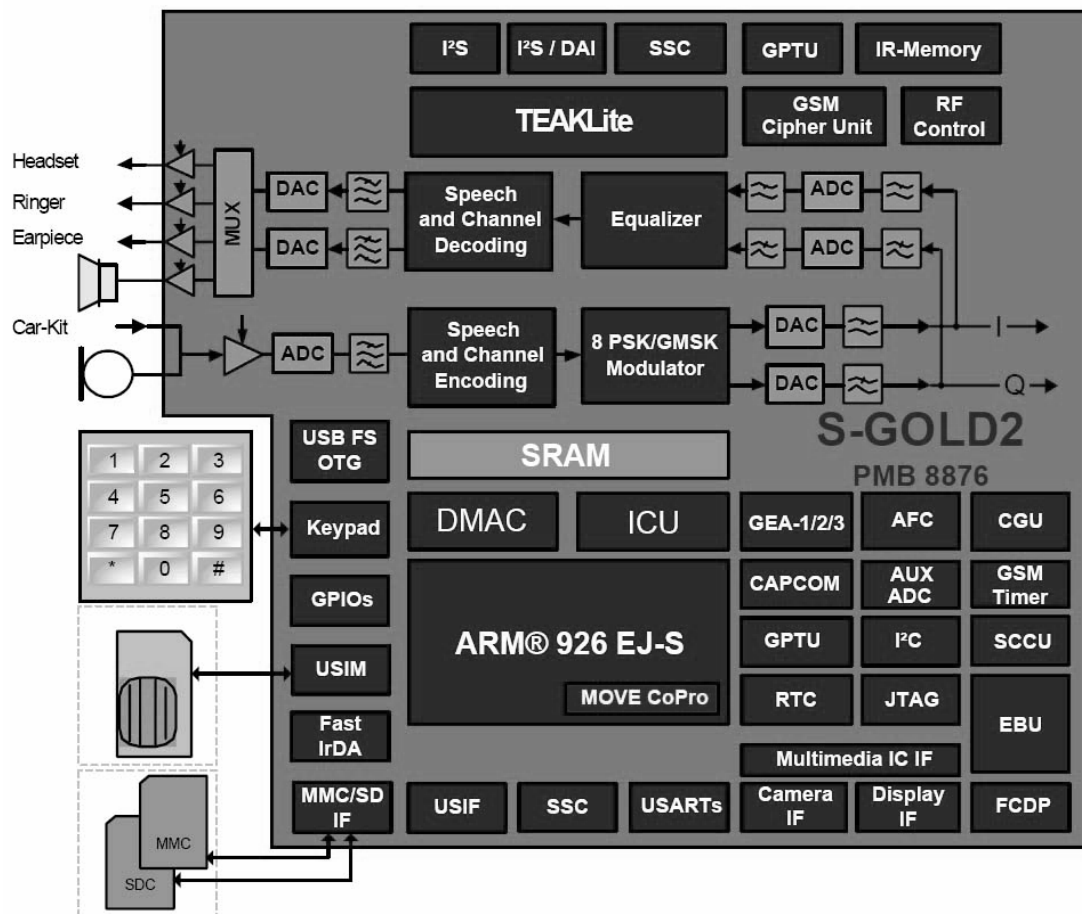


Figure 2. Top level block diagram of the S-GOLD2™ (PMB8876)

##### 3.2.1 General Description

S-GOLD2™ is a GSM/EDGE single chip mixed signal Baseband IC containing all analog and digital functionality of a cellular radio. Additionally S-GOLD2™ Provides multimedia extensions such as camera, software MIDI, MP3 sound. It is designed as a single chip solution, integrating the digital and mixed signal portions of the base band in 0.13um, 1.5V technology. The chip will fully support the FR, EFR, HR and AMR-NB vocoding. S-GOLD2™ support multi-slot operation modes HSCSD (up to class 10), GPRS for high speed data application (up to class 12) and EGPRS (up to class 12) without additional external hardware.

### 3.2.2. Block Description

- Processing core
  - ARM926EJ-S 32 bit processor core for controller functions. The ARM926EJ-S includes an MMU, and the Jazelle Java extension for Java acceleration.
  - TEAKLite DSP core
- ARM-Memory
  - 32k Byte Boot ROM on the AHB
  - 96k Byte SRAM on the AHB, flexibly usable as program or data RAM
  - 16k Byte Cache for Program (internal)
  - 8k Byte tightly coupled memory for Program(internal)
  - 8k Byte Cache for Data(internal)
  - 8k Byte tightly coupled memory for Data(internal)
- DSP-Memory
  - 104K x 16bit Program ROM
  - 8k x 16bit Program RAM
  - 60k x 16bit Data ROM
  - 37k x 16bit Data RAM
  - Incremental Redundancy(IR) Memory of 35904 words of 16bit
- Shared Memory Block
  - 1.5K x 32bit Shared RAM(dual ported) between controller system and TEAKLite.
- Controller Bus system
  - The processor cores and their peripherals are connected by powerful buses. Multi-layer AHB for connecting the ARM and the other master capable building blocks with the internal and external memories and with the peripheral buses.
- Clock system
  - The clock system allows widely independent selection of frequencies for the essential parts of the S-GOLD2. Thus power consumption and performance can be optimized for each application.
- Functional Hardware block
  - CPU and DSP Timers
  - MOVE coprocessor performing motion estimation for video encoding algorithms (H.263, MPEG-4)
  - Programmable PLL with additional phase shifters for system clock generation
  - GSM Timer Module that off-loads the CPU from radio channel timing
  - GMSK / 8-PSK Modulator according to GSM-standard 05.04 (5/2000)
  - GMSK Modulator: gauss-filter with  $B \cdot T = 0.3$
  - EDGE Modulator: 8PSK-modulation with linearized GMSK-Pulse-Filter
  - Hardware accelerators for equalizer and channel decoding.
  - Incremental Redundancy memory for EDGE class 12 support
  - A5/1, A5/2, A5/3 Cipher unit
  - GEA1, GEA2, GEA3 Cipher Unit to support GPRS data transmission

### 3. TECHNICAL BRIEF

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- Advanced static and dynamic power management features including TDMA-Frame synchronous low power mode and enhanced CPU modes(idle and sleep modes)
- Pulse Number Modulation output for Automatic Frequency Correction(AFC)
- Serial RF Control interface: support of direct conversion RF
- A Universal Serial Interface(USIF) enabling asynchronous (UART) or synchronous (SPI) serial data transmission
- 1 Serial Synchronous SPI compatible interfaces in the controller domain
- 1 Serial Synchronous SPI compatible interface in the TEAKLite domain
- 2 USART with autobaud detection, hardware flow control and integrated IrDA controller supporting IrDA's SIR standard (up to 115.2Kbps)
- A dedicated Fast IrDA Controller supporting IrDA's SIR, MIR and FIR standards (up to 4Mbps)
- I2C-bus interface (e.g. connection to S/M power)
- A fast display interface supporting serial and parallel interconnection
- An ITU-R BT.656 compatible Camera interface.
- Programmable clock output for a camera
- An multimedia/Secure Digital Card Interface (MMC/SD:SDIO capable)

#### 3.2.3. External Devices connected to memory interface

Table 1 Memory interface

Device	Name	Maker	Remark
FLASH	PF38F5060M0Y0B0	Intel	Synchronous / Asynchronous
SDRAM	PF38F5060M0Y0B0	Intel	Synchronous 104MHz
LCD	IL220DBN1A	LGIT	8bit access 3times transmission
Melody IC	Not Used	S/W	Infineon Software CODEC

#### 3.2.4. RF Interface (T\_OUT)

S-Gold2 uses this interface to control RF IC and Peripherals. 13 signals are provided switch on/off RF ICs Periodically each TDMA frame.

Table 2 RF Interface Spec.

T_OUT		
Resource	Interconnection	Description
T_OUT0	TXON_PA	PAM Power on
T_OUT1	VIBRATOR_EN	VIBRATOR ON-
T_OUT2	PA_BAND	TX RF band select
T_OUT3	ANT_SW1	FEM control
T_OUT4	ANT_SW2	FEM control
T_OUT5	ANT_SW3	FEM control
T_OUT6	MODE	PAM Mode select

### 3.2.5. USART Interface

KE970 have two UART Drivers as follow :

- USART1 : Hardware Flow Control / SW upgrade / Calibration
- USART2 : SW debug trace.

Table 3 USART Interface Spec.

USART_0(USART1)		
Resource	Name	Remark
USART0_TXD	TXD_0	Transmit Data
USART0_RXD	RXD_0	Receive Data
USART0_CTS	CTS_0	Clear To Send
USART0_RTS	RTS_0	Request To Send
	DSR	N.C.
USART_1(USART2)		
USART1_TXD	TX_DEBUG	Trace data tx
USART1_RXD	RX_DEBUG	Trace data rx
USART1_CTS	N.C.	N.C.
USART1_RTS	N.C.	N.C.

### 3.2.6. ADC channel

BBP ADC block is composed of 7 external ADC channel . This block operates charging process and other related process by reading battery voltage and other analog values.

Table 4 S-Gold2 ADC channel usage

ADC channel		
Resource	Interconnection	Description
M0	BATT_TEMP	Battery temperature measure
M1	RF_TEMP	RF block temperature measure
M2	JACK_TYPE	Accessory type detect
M7	H/W VERSION	S-Gold2 H/W version detect
M8	VSUPPLY	Battery supply voltage measure
M9	I_MONITOR	Current consumption measure
M10	REMOTE_ADC	Remote control key detect

### 3. TECHNICAL BRIEF

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#### 3.2.7. GPIO map

Over a hundred allowable resources, KE970 is using as follows except dedicated to SIM and Memory. KE970 GPIO(General Purpose Input/Output) Map, describing application, I/O state, and enable level, is shown in below table.

Table 5 S-Gold2 GPIO pin Map

Port function	KE260 Net Name	Description
KEY MATRIX		
KP_IN0	KP_IN0	Refer to Key Matrix
KP_IN1	KP_IN1	Refer to Key Matrix
KP_IN2	KP_IN2	Refer to Key Matrix
KP_IN3	KP_IN3	Refer to Key Matrix
KP_IN4	KP_IN4	Refer to Key Matrix
KP_IN5	KP_IN5	Refer to Key Matrix
KP_OUT5	KP_OUT5	Refer to Key Matrix
KP_OUT0	KP_OUT0	Refer to Key Matrix
KP_OUT1	KP_OUT1	Refer to Key Matrix
KP_OUT2	KP_OUT2	Refer to Key Matrix
KP_OUT3	KP_OUT3	Refer to Key Matrix
USART_0		
USART0_RXD	RXD_0	UART0, RS232 Data
USART0_TXD	TXD_0	UART0, RS232 Data
USART0_RTS_N	CTS_0	UART0, RS232 RTS
USART0_CTS_N	RTS_0	UART0, RS232 CTS
CC1CC6IO	FM_INT	For FM Radio Interrupt
USART_1		
USART1_RXD	TX_DEBUG	For debugging
USART1_TXD	RX_DEBUG	For debugging
USART1_RTS_N	Not Use	
USART1_CTS_N	Not Use	
USB		
USB_DPLUS	USB_DP	USB data
USB_DMINUS	USB_DM	USB data

### 3. TECHNICAL BRIEF

MEMORY & CLK		
GPIO_20	F_DPD	For INTEL Memory
CLK32K	CLK32K	For FM Radio & BLUETOOTH
GPIO_22	Not Use	
CAMERA I/F		
CIF_D0	CIF_D(0)	Camera DATA[0]
CIF_D1	CIF_D(1)	Camera DATA[1]
CIF_D2	CIF_D(2)	Camera DATA[2]
CIF_D3	CIF_D(3)	Camera DATA[3]
CIF_D4	CIF_D(4)	Camera DATA[4]
CIF_D5	CIF_D(5)	Camera DATA[5]
CIF_D6	CIF_D(6)	Camera DATA[6]
CIF_D7	CIF_D(7)	Camera DATA[7]
CIF_PCLK	CIF_PCLK	Camera pixel clock
CIF_HSYNC	CIF_HS	Camera H sync
CIF_VSYNC	CIF_VS	Camera V sync
CLKOUT	CIF_MCLK	Camera main clock
CIF_PD	CIF_PD	Camera power down(active high)
CIF_RESET	CIF_RESET	Camera reset
LCD IF/		
DIF_D0	DIF_D(0)	LCD data[0]
DIF_D1	DIF_D(1)	LCD data[1]
DIF_D2	DIF_D(2)	LCD data[2]
DIF_D3	DIF_D(3)	LCD data[3]
DIF_D4	DIF_D(4)	LCD data[4]
DIF_D5	DIF_D(5)	LCD data[5]
DIF_D6	DIF_D(6)	LCD data[6]
DIF_D7	DIF_D(7)	LCD data[7]
DIF_CS1	DIF_CS	LCD chip select
GPIO_96	FM_BBP_SEL	Audio amp inuput select(High: FM sound, Low: BBP sound)
DIF_CD	DIF_CD	Command Data switch
DIF_WR	MM_WR	LCD Write
DIF_RD	MM_RD	LCD Read

### 3. TECHNICAL BRIEF

GPIO_99	_USB_CHG_EN	USB charging (High: charge disable, Low: enable)
DIF_VD (in)	_TF_PWR_EN	Trans-Flash card power enable(active low)
DIF_RESET1_GPIO	DIF_RESET1	LCD Reset
EINT6	REMOTE_INT	For Remote Control Headset
I2c		
I2C_SCL	SCL	For SM-Power, FM Radio, Audio AMP
I2C_SDA	SDA	"
PM_INT (EINT)	PM_INT	SM-Power interrupt
SIM CARD		
CC_IO	SIM_IO	SIM CARD I/O
CC_CLK	SIM_CLK	SIM CARD CLOCK
CC_RST	SIM_RST	SIM CARD RESET
I2S		
I2S2_CLK0	Not Use	
GPIO_102	_WP	Not Connected
I2S2_RX	Not Use	
I2S2_TX	Not Use	
I2S2_WA0	Not Use	
I2S2_WA1	Not Use	
EXTERNAL MEMORY		
MMCI_CMD	TF_CMD	For T-Flash
MMCI_DAT[0]	TF_DAT0	"
MMCI_CLK	TF_CLK	"
BT I/F		
USIF_TXD_MTSR	USIF_TXD	For Bluetooth
USIF_RXD_MRST	USIF_RXD	"
GPIO_109	_USB_EOC	USB End of charging detect(High: EOC, Low: charging)
GPIO_110	RPWRON	Remote power on detect (High: Remote , Low: Normal
GPIO_111	SPK_RCV_SEL	Audio pass select( high: Speaker, Low: Receiver)
I2S		
I2S1_CLK0	I2S1_CLK	For Bluetooth
GPTU0_0	FLASH_EN	For Camera Flash LED

### 3. TECHNICAL BRIEF

I2S1_RX	I2S1_RX	For Bluetooth
I2S1_TX	I2S1_TX	"
I2S1_WA0	I2S1_WA0	"
MMC		
MMCI_DAT[1]	TF_DAT1	For T-Flash
MMCI_DAT[2]	TF_DAT2	"
MMCI_DAT[3]	TF_DAT3	"
AUDIO I/F		
EPN1	RCV_N	For Receiver
EPP1	RCV_P	"
EPPA1	BBP_SND_L	For Speaker
EPPA2	BBP_SND_R	For Speaker
MICN1	MIC1_N	For Mic
MICP1	MIC1_P	"
MICN2	MIC2_N	For Headset Mic
MICP2	MIC2_P	"
VMICP	VMICP	For Mic
VMICN	VMICN	"
RF I/F		
PAOUT1		
PAOUT2		
BB_I		
BB_IX		
BB_Q		
BB_QX		
ADC		
M_0	BAT_TEMP	Battery temperature detect
M_1	RF_TEMP	RF Power amp reference temperature detect
M_2	JACK_TYPE	For 18Pin Cable Type Detect
M_7		HW revision indication
M_8		Battery voltage measurement
M_9	I_MONITOR	Current consumption measurement
M_10	REMOTE_ADC	For Remote Control Headset Key detect with REMOTE_INT
Reference		
VREF		
IREF		
JTAG		
TDO	TDO	For JTAG & ETM Interface
TDI	TDI	"
TMS	TMS	"
TCK	TCK	"
TRST_n	TRSTn	"
RTCK	RTCK	"



### 3. TECHNICAL BRIEF

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ETM		
TRIG_IN	TRIG_IN	"
MON1	MON1	"
MON2	MON2	"
TRACESYNC	TRACESYNC	"
TRACECLK	TRACECLK	"
PIPESTAT[2]	PIPESTAT[2]	"
PIPESTAT[1]	PIPESTAT[1]	"
PIPESTAT[0]	PIPESTAT[0]	"
TRACEPKT[0]	TRACEPKT[0]	"
TRACEPKT[1]	TRACEPKT[1]	"
TRACEPKT[2]	TRACEPKT[2]	"
TRACEPKT[3]	TRACEPKT[3]	"
TRACEPKT[4]	TRACEPKT[4]	"
TRACEPKT[5]	TRACEPKT[5]	"
TRACEPKT[6]	TRACEPKT[6]	"
TRACEPKT[7]	TRACEPKT[7]	"
Memory		
EBU_AD[0]	D(0)	Data bus[0]
EBU_AD[1]	D(1)	Data bus[1]
EBU_AD[2]	D(2)	Data bus[2]
EBU_AD[3]	D(3)	Data bus[3]
EBU_AD[4]	D(4)	Data bus[4]
EBU_AD[5]	D(5)	Data bus[5]
EBU_AD[6]	D(6)	Data bus[6]
EBU_AD[7]	D(7)	Data bus[7]
EBU_AD[8]	D(8)	Data bus[8]
EBU_AD[9]	D(9)	Data bus[9]
EBU_AD[10]	D(10)	Data bus[10]
EBU_AD[11]	D(11)	Data bus[11]
EBU_AD[12]	D(12)	Data bus[12]
EBU_AD[13]	D(13)	Data bus[13]
EBU_AD[14]	D(14)	Data bus[14]
EBU_AD[15]	D(15)	Data bus[15]
EBU_WR_n	_WR	Write strobe

### 3. TECHNICAL BRIEF

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EBU_RD_n	_RD	Read strobe
EBU_BC0_n	_BC0	
EBU_BC1_n	_BC1	
EBU_A[0]	A(0)	Address bus[0]
EBU_A[1]	A(1)	Address bus[1]
EBU_A[2]	A(2)	Address bus[2]
EBU_A[3]	A(3)	Address bus[3]
EBU_A[4]	A(4)	Address bus[4]
EBU_A[5]	A(5)	Address bus[5]
EBU_A[6]	A(6)	Address bus[6]
EBU_A[7]	A(7)	Address bus[7]
EBU_A[8]	A(8)	Address bus[8]
EBU_A[9]	A(9)	Address bus[9]
EBU_A[10]	A(10)	Address bus[10]
EBU_A[11]	A(11)	Address bus[11]
EBU_A[12]	A(12)	Address bus[12]
EBU_A[13]	A(13)	Address bus[13]
EBU_A[14]	A(14)	Address bus[14]
EBU_A[15]	A(15)	Address bus[15]
EBU_A[16]	A(16)	Address bus[16]
EBU_A[17]	A(17)	Address bus[17]
EBU_A[18]	A(18)	Address bus[18]
EBU_A[19]	A(19)	Address bus[19]
EBU_A[20]	A(20)	Address bus[20]
EBU_A[21]	A(21)	Address bus[21]
EBU_A[22]	A(22)	Address bus[22]
EBU_A[23]	A(23)	Address bus[23]
EBU_A[24]	A(24)	Address bus[24]
EBU_CS0_n	_FLASH1_CS	Flash ROM chip select
EBU_CS1_n	_RAM_CS	SDRAM Chip select
EBU_CS2_n	_FLASH2_CS	Not used
EBU_CS3_n	_CS3	Not used
EBU_ADV_n	_ADV	
EBU_RAS_n	_RAS	
EBU_CAS_n	_CAS	

### 3. TECHNICAL BRIEF

EBU_WAIT_n	_WAIT	
EBU_SDCLKO	SDCLKO	
EBU_SDCLKI	SDCLKI	
EBU_BFCLKO	BFCLKO	
EBU_BFCLKI	BFCLKI	
EBU_CKE	CKE	
Memory		
FCDP_RBn	F_DPD	
TDMA RF I/F		
T_OUT0	TXON_PA	RF Power amp turn on
GPIO_44	VIBRATOR_EN	Vibrator enable(High: enable, Low:disable)
T_OUT2	PA_BAND	RF band select
T_OUT3	ANT_SW1	RF FEM control signal 1
T_OUT4	ANT_SW2	RF FEM control signal 2
EINT3	ANT_SW3	RF FEM control signal 3
T_OUT6	MODE	For RF
GPIO_50	KP_OUT(4)	Key pad
EINT7	JACK_DETECT	Headset Detect(High: unplugged, Low: plugged)
CC1CC3IO	LCD BACKLIGHT	LCD Backlight Control
GPIO_53	LCD ID	Neodis : L
GPIO_54	_FM_RESET	FM Radio chip reset
GPIO_55	AU_PWR_EN	Audio amp power enable( active high)
RF I/F		
RF_STR0	EN	RF Transceiver chip enable
GPIO_57	TF_DETECT	Micro SD card detect (High: inserted, Low: ejected)
RF_DATA	DA	RF Transceiver chip data
RF_CLK	CLK	RF Transceiver chip clock
System port		
AFC	AFC	Automatic Frequency control DAC output for 26MHz VCTCXO
CLKOUT0 [<=26MHz]	Not Use	
F26M	26MHZ_MCLK	Baseband processor PLL input Main clock

### 3. TECHNICAL BRIEF

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F32K		Sleep crystal 32.768KHz
OSC32K		Sleep crystal 32.768KHz
RESET_n	_RESET	Baseband processor reset
CC1CC1IO	TRIG_OUT	For JTAG & ETM Interface
RTC_OUT	RTC_OUT	Wake up signal to alarm (High; wake up, Low: Power off)
VCXO_EN	VCXO_EN	26MHz clock enable
DSP		
DSPIN0	_BT_RESET	Bluetooth chip reset
GPIO_62	MIC_GAIN_SEL	Microphone gain select (High: 12dB, Low: 0dB)
GPIO_63	_SIM_EN	SIM card power enable

## 3. TECHNICAL BRIEF

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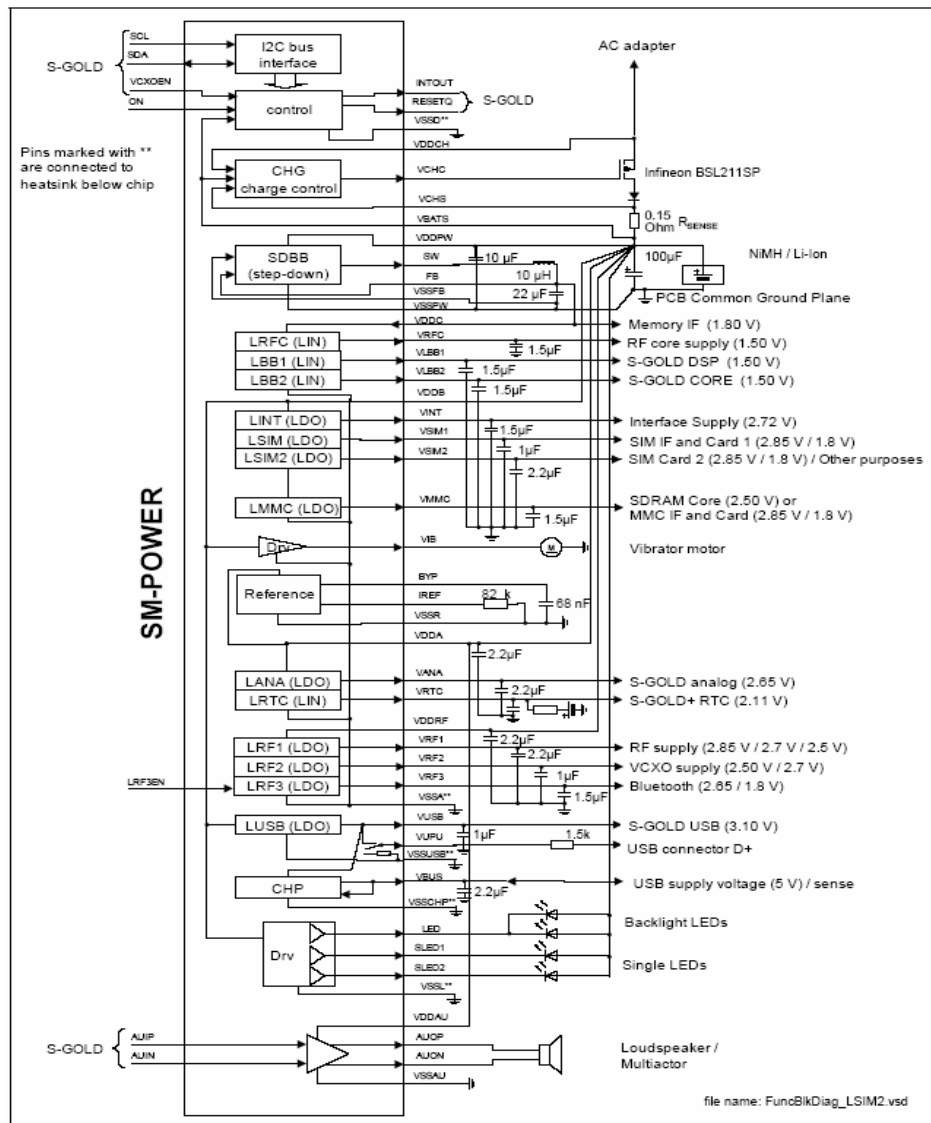
### 3.3. Power management IC

#### 3.3.1. General Description

SM-POWER is a highly integrated Power and Battery Management IC for mobile handsets. It has been specially designed for usage with S-Gold2. Although optimized for usage with the Infineon S-GOLD baseband device it is suitable for the S-GOLDlite and the E-GOLD+ baseband devices as well. It also supports the cellular RF devices like SMARTi-DC, SMARTi-DC+, SMARTi-SD and the Bluemoon Single, Infineon's single chip solution for Bluetooth. If used with S-GOLD2 it provides all power supply functions (except for the RF PA) for a complete advanced GSM Edge smart phone minimizing external device count.

#### Block Description

- Highly efficient step-down converter for main digital baseband supply including Core, DSP and memory interface (External Bus Unit).
- Support of S-GOLD standby power-down concept
- Low-drop-out (LDO) regulators for Flash and mobile RAM memory devices
- Voltage independent switching of two SIM cards
- LDO regulators for baseband I/O supply
- LDO regulator for analog mixed-signal section of S-GOLD
- Low-noise LDO regulators for RF devices
- Supply for Bluemoon Single, Infineon's single chip solution for Bluetooth
- Audio amplifier 8 Ohms for handsfree operation and ringing
- Charge Control for charging Li-Ion/Polymer batteries under software control
- Pre-charge current generator with selectable current level
- RTC regulator with ultra-low quiescent current
- USB interface support for peripheral and mini-host mode
- Backlight LEDs driver with current selection and PWM dimming function
- Two single LED driver outputs for signaling
- Vibrator driver with adjustable voltage
- Fully controllable by software via I2C - Bus
- Temperature and battery voltage sensors
- Interrupt channels for peripherals
- System debug mode
- VQFN 48 package with heat sink and non-protruding leads
- Compatible with the Infineon E-GOLD+ V2 and V3



**Figure 3 Top level block diagram of the SM-Power(PMB6812)**

SM-POWER is a further step on the successful E-Power product line with enhanced and optimized functionality. SM-POWER features a baseband supply concept with a DC/DC step-down converter (SDBB) cascaded by two linear regulators (LBB1/2)

- SM-POWER's DC/DC converter makes up to 40 % reduction of battery current for smart phone functions (e.g. organizer functions, games, MP3 decoding) possible.
- SDBB has high efficiency up to 95% and also a power save mode.
- Memory Interface is directly supported by the SDBB
- SDBB can also act as main supply voltage for E-GOLD+ or S-GOLDlite baseband devices.
- For S-GOLD two linear regulators for DSP and Core are cascaded after the SDBB.

### 3. TECHNICAL BRIEF

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SM-POWER supports the standby power-down concept of S-GOLD by temporarily switching off the linear regulator LBB1 for the DSP during mobile standby whenever this subsystem is not used. In this phase the ARM controller and most peripherals including parts of the on-chip SRAM are kept powered-up with power being supplied by the other linear regulator LBB2.

SM-POWER includes a fully differential audio amplifier able to drive loads down to a nominal value of 8 Ohm for usage in hands-free phones and for ringing

- 400 mW maximum output power
- adjustable gain
- mute switch
- click and pop - protection

SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries

- Precharge current source with two current levels
- Constant current / constant voltage charging with 3 different termination voltages
- Programable charge current limitation for use with different batteries
- Freely programable pulse charging to reduce the thermal power dissipation in the constant voltage charging phase
- Top-off charge current sensing

SM-POWER completes the USB interface of S-GOLD

- Regulated voltage for S-GOLD USB interface including reverse current and overvoltage protection
- Switch to supply USB pull-up resistor
- Mini-host pull down resistor functionality
- Charge pump with internal switching capacitor for USB host VBUS supply voltage

SM-POWER fully supports LED and Vibra Motor functionality

- no external components needed
- driver for backlight LEDs adjustable in steps up to 140mA and with soft turn on and off by PWM dimming
- two driver outputs for single LEDs for precharge indication and signaling with i.e. change of colour
- driver for Vibra Motor with adjustable voltages, soft startup / shutdown and current limitation

SM-POWER offers several control functions

- Power-on Reset Generator with logic state machine
- I2C bus interface
- I2C bus configurable mode control logic with ON (push-button or RTC), VCXOEN and LRF3EN (wake-up by Bluetooth) inputs
- Programable interrupt channels to handle peripherals like SIM, MMC and USB
- Monitoring of charging functions
- Undervoltage Shut-Down
- Errorflags (volatile or non-volatile) from many power-supply functions and thermal sensor in order to debug system
- Overtemperature Shut-Down
- Overtemperature Warning
- Support of S-GOLD standby power-down concept
- Support of S-GOLD Power-Down Pad Tristate Function

### 3. TECHNICAL BRIEF

Table 6 LDO Output Table of SM-Power

LDO	Net name	Output Voltage	Output Current	Usage
SDBB	1V8_MEM	1.8V	850mA	Memory & for LDO
LRFC	1V5_RF	1.5V	120mA	RF transceiver
LBB1	1V5_DSP	1.5V	170mA	DSP in BBP
LBB2	1V5_CORE	1.5V	300mA	ARM core in BBP
LINT	2V72_IO	2.72V	135mA	Peripherals
LSIM	2V85_SIM	2.85V	22mA	SIM card
LSIM2	2V85_IO2	2.85V	200mA	Peripherals
LMMC	2V85_CARD	2.85V	135mA	SD card
LANA	2V65_ANA	2.65V	220mA	Analog block in BBP
LRTC	2V11_RTC	2.11V	0.3mA	RTC block & Backup battery
LRF1	2V85_RF	2.85V	250mA	RF IC
LRF2	2V7_RF	2.7V	10mA	RF IC
LRF3	2V65_BT	2.65V	150mA	BT IC(Blue moon)
LUSB	3V1_USB	3.1V	45mA	USB I/F

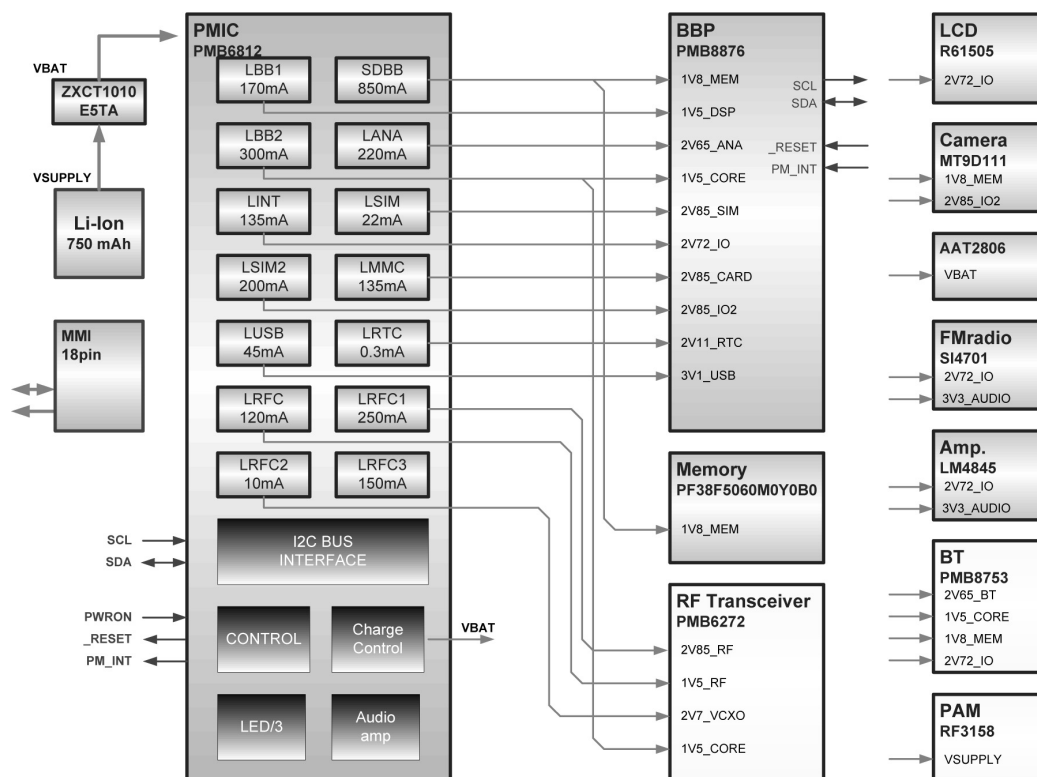
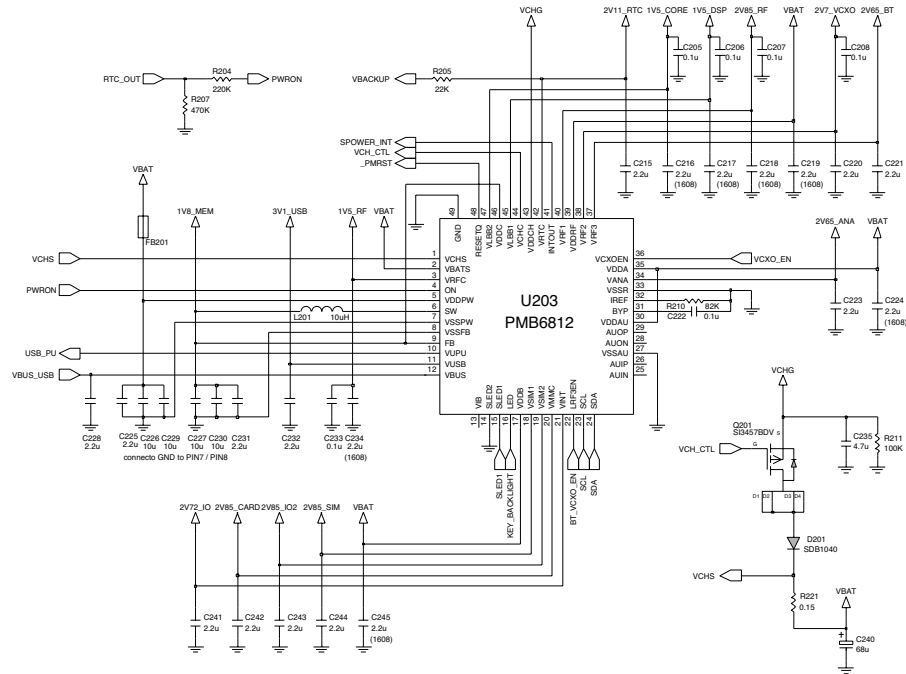


Figure 4 Power domain block diagram of KE970



### 3. TECHNICAL BRIEF

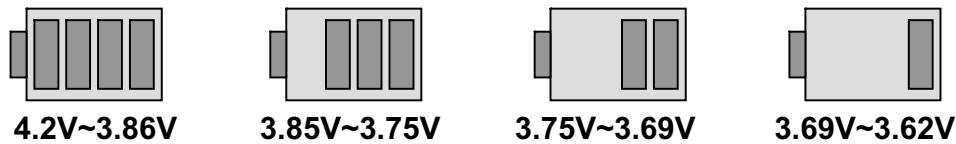
PMIC & Li-ion CHARGER



**Figure 5 SM-Power circuit diagram with charging part**

#### 3.3.2. Charging

SM-POWER provides together with an external p-channel FET Siliconix Si3455 an external AC-adaptor a complete charge control function for charging of Li-Ion or Li-Ion-Polymer batteries. Either a 1-cell Li-Ion or Li-Ion-Polymer battery with 4.1, 4.2 or 4.4 Volts may be used.



**Figure 6 Battery Block Indication**

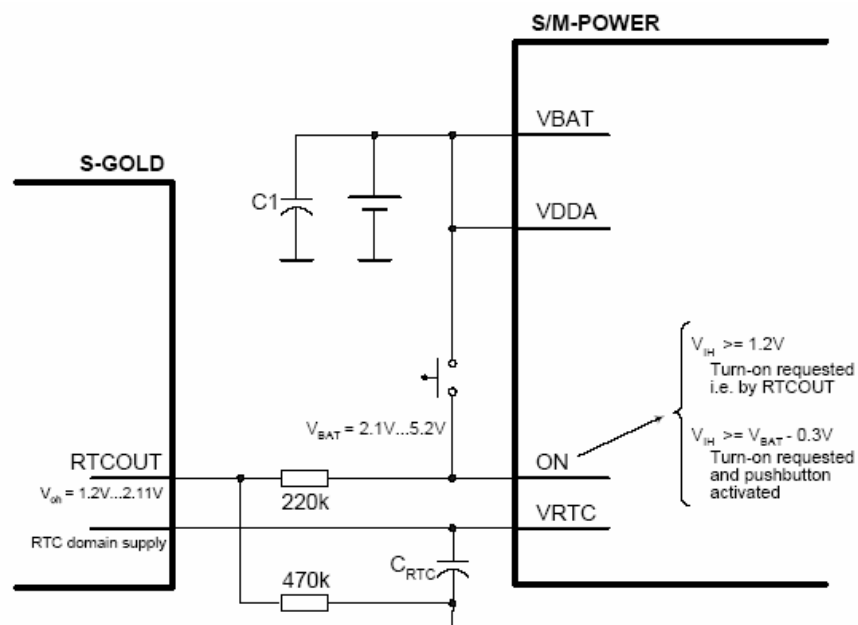
1. Charging method : CC-CV
2. Charger detect voltage : 4.0V
3. Charging time : 3h
4. Charging current : 500mA
5. CV voltage : 4.2V
6. Cutoff current : 100mA
7. Full charge indication current (icon stop current) : 100mA

8. Recharge voltage : 4.00V
9. Low battery alarm
  - a. Idle : 3.50V~3.35V
  - b. Dedicated : 3.59V~3.35V
10. Low battery alarm interval
  - a. Idle : 3min
  - b. Dedicated:1min
11. Switch-off voltage : 3.35V
12. Charging temperature adc range
  - a.  $\sim -5^{\circ}\text{C}$  : low charging voltage operation (3.6V  $\sim$  3.9V) .
  - b.  $-5^{\circ}\text{C} \sim 50^{\circ}\text{C}$  : standard charging (up to 4.2 V)
  - c.  $50^{\circ}\text{C} \sim$  : low charging voltage operation (3.6V  $\sim$  3.9V)

### 3.4. Power ON/OFF

KE970 Power State : Defined 3cases as follow

- Power-ON : Power key detect ( SM-Power's ON port
- Power-ON-charging : Charger detect.
- Power-ON-remote : remote power on detect (Factory use only)

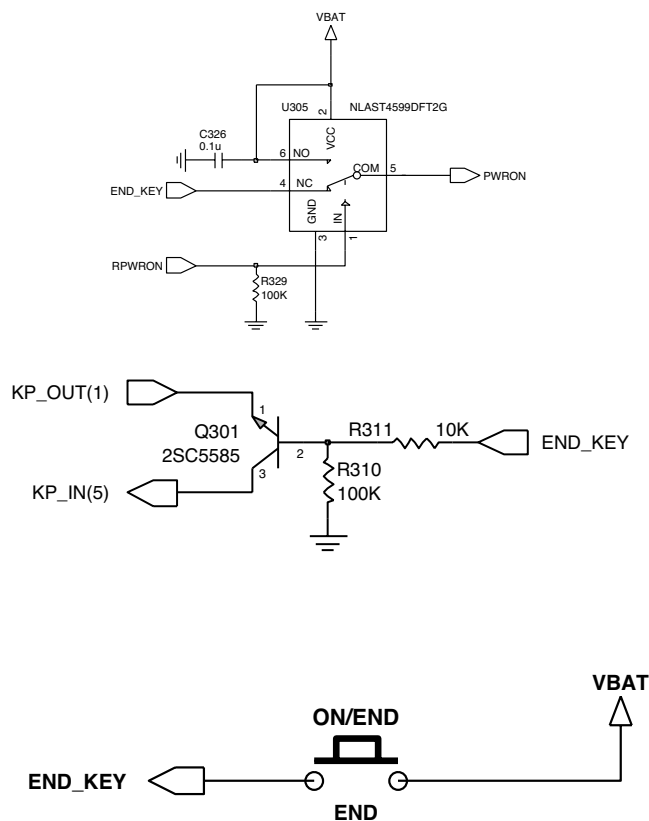


**Figure 7 Power on application.**

### 3. TECHNICAL BRIEF

Input ON is a power-on input for SM-POWER with 2 active high levels (see Figure 8). It might be triggered by a push button or by the RTCOUT output of the S-GOLD device as well. To detect if the push-button is pressed during system operation the logical level at pin ON or its change (if Bit 1 EION in INTCTRL2 is asserted) is recorded in bit LON of the ISF register. If the high level of voltage at pin ON does not reach VIHdet ( $V_{bat}-0.8 \sim V_{bat}-0.3$ ) the above-mentioned bit won't be set.

To support Remote power on function for factory mass production, applied an analog switch as following figure. As monitoring the RPWRON(GPIO\_110) and Key matrix KP\_OUT(1) & KP\_IN(5), KE970 system recognize whether remote power on or End-key pushed

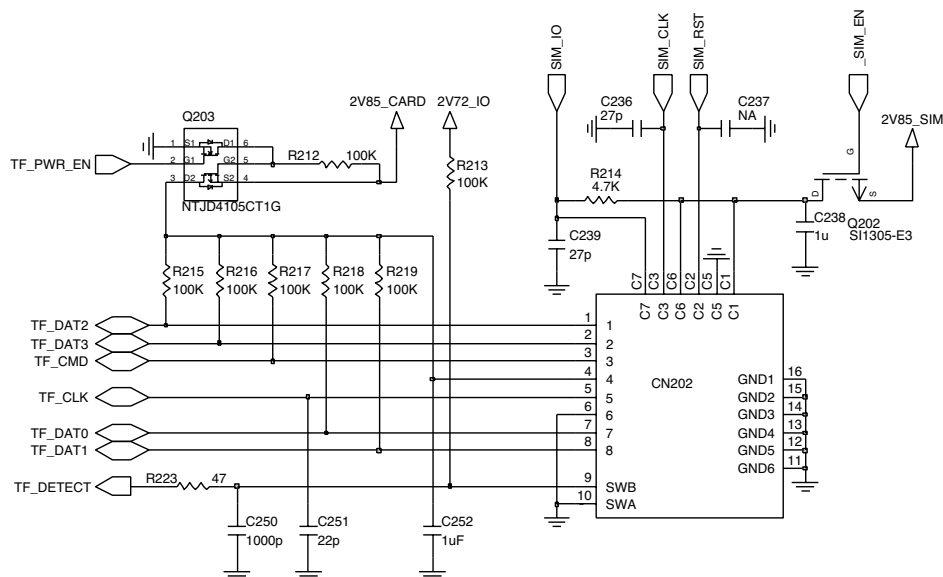


**Figure8 Remote power on and End-key power on circuit**

KE970 supports 3V plug in SIM, SIM interface scheme is shown in (Figure 10).

## SIM Interface

SIM\_CLK : SIM card reference clock  
SIM\_RST : SIM card Async /sync reset  
SIM\_IO : SIM card bidirectional reset



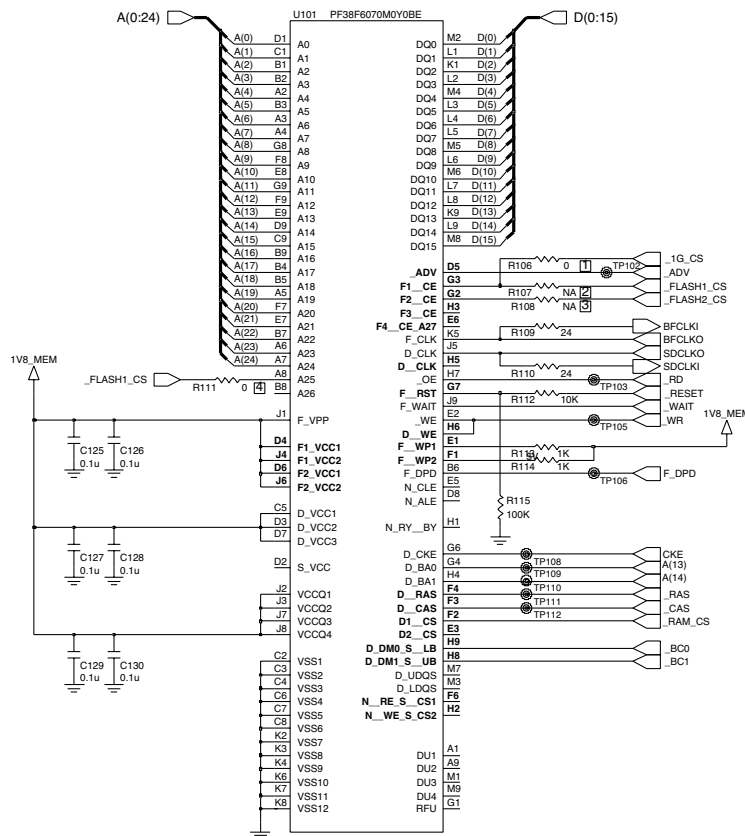
### Figure 9 SIM CARD Interface

## 3. TECHNICAL BRIEF

### 3.6. Memory

512Mbit Flash & 256Mbit SDRAM employed on KE970 with 16 bit parallel data bus thru ADD(0) ~ ADD(24). The 512Mbit Sibley Wireless Flash memory with LPSPDRAM stacked device family offers multiple high-performance solutions. The Sibley flash die is manufactured on 90 nm process technology.

It delivers 108 MHz synchronous burst and page-mode read rates with supports multi-partitioning with Read-While-Write (RWW) or Read-While-Erase (RWE) dual operations. The LPSPDRAM is a high-performance volatile memory operating at speeds up to 104 MHz with configurable burst lengths.



**Figure 10 Flash memory & SDRAM MCP circuit diagram**

### 3.7. LCD Display

LCD module include:

- LCD : 320\*240 265K Color TFT LCD
- Backlight : 5 piece of white LED illumination

LCD module is connected to main board thru 35 pins connector.

LCD FPC Interface Spec:

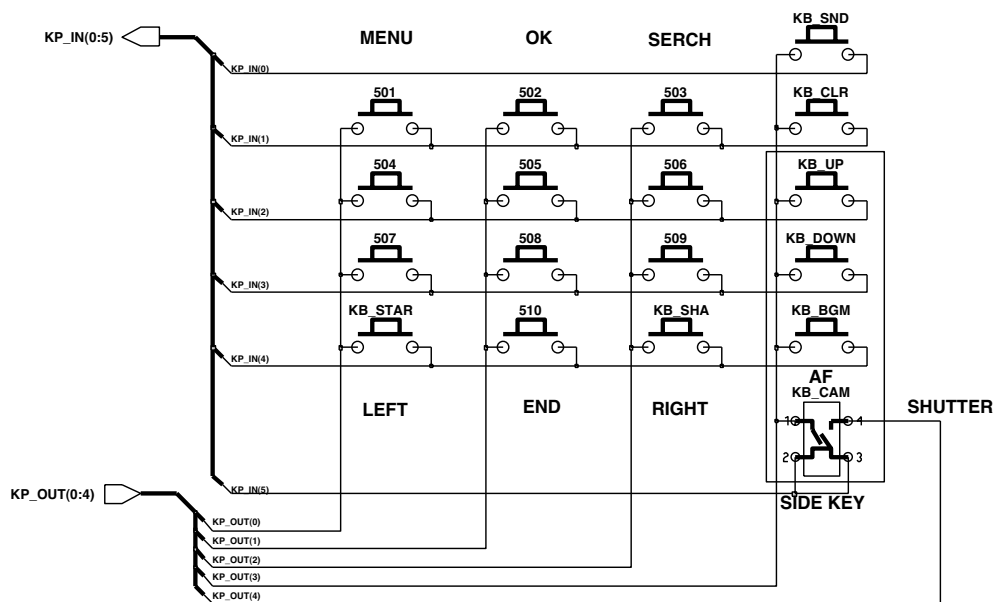
Table 7 LCD FPC Interface Spec.

Pin No.	Pin Name	I/O	Description
1	VCC(2.8V)	Power	LCD power supply
2	VDDIO(2.8V)	Power	LCD power supply
3	GND	Power	LCD power supply
4	MAKER_ID	O	LCD maker Identification
5	D0	I/O	Data[0] for LCD
6	D1	I/O	Data[1] for LCD
7	D2	I/O	Data[2] for LCD
8	D3	I/O	Data[3] for LCD
9	D4	I/O	Data[4] for LCD
10	D5	I/O	Data[5] for LCD
11	D6	I/O	Data[6] for LCD
12	D7	I/O	Data[7] for LCD
13	D8	I/O	Data[8] for LCD
14	D9	I/O	Data[9] for LCD
15	D10	I/O	Data[10] for LCD
16	D11	I/O	Data[11] for LCD
17	D12	I/O	Data[12] for LCD
18	D13	I/O	Data[13] for LCD
19	D14	I/O	Data[14] for LCD
20	D15	I/O	Data[15] for LCD
21	GND	-	Ground
22	/RESET	I	Reset
23	/WR	I	Write strobe
24	/RD	I	Read strobe
25	/CS	I	LCD chip select
26	RS	I	Command / Data switch
27	IFMODE	I	8bit / 16bit switch
28	GND	-	Ground
29	VSYNC_OUT	I	NA
30	MLED_Cathod5	O	Back light LED Cathode
31	MLED_Cathod4	O	Back light LED Cathode
32	MLED_Cathod3	O	Back light LED Cathode
33	MLED_Cathod2	O	Back light LED Cathode
34	MLED_Cathod1	O	Back light LED Cathode
35	MLED_Anode	I	Back light LED Anode

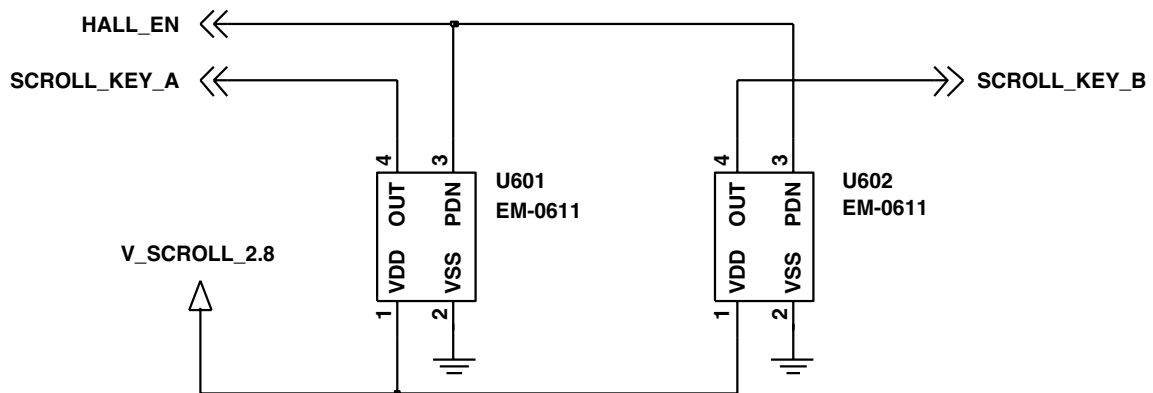
### 3. TECHNICAL BRIEF

#### 3.8. Keypad Switching & Scanning

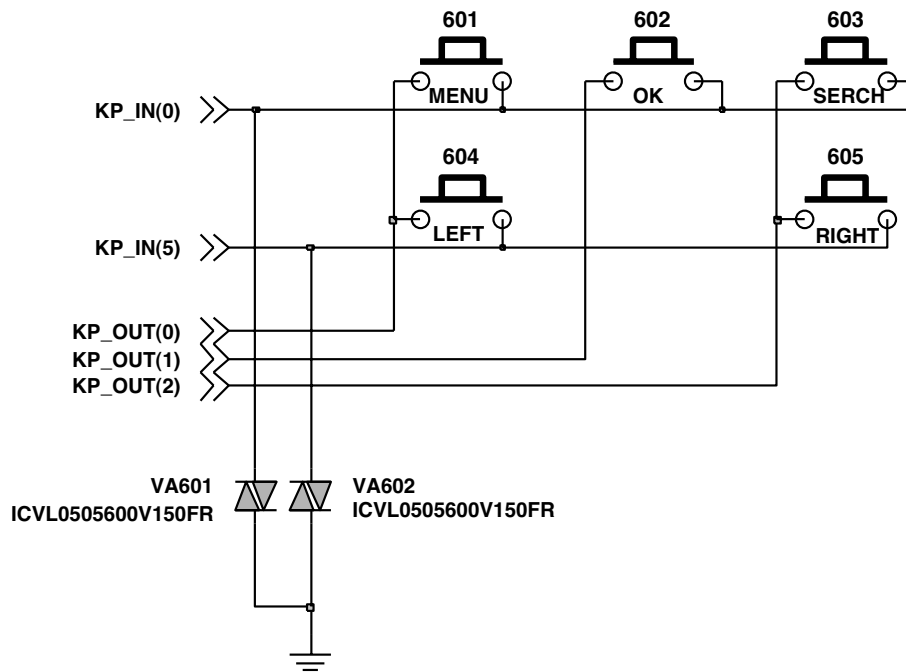
The keypad interface is a peripheral which can be used for scanning keypads up to 6 rows (outputs from Port Control Logic) and 6 columns (inputs to PCL). The number of rows and columns depend on settings of the PCL.



**Figure 11 KEY FPCB part numeric key matrix**



### 3. TECHNICAL BRIEF



**Figure 12 LCD PCB part Navi & Scroll key matrix**

Most of numeric keys are located on the Keypad FPCB, Scroll key for menu navigation is on the LCD FPCB, and Power on (End key), BGM hot key, Camera shutter and volume up & down keys are connected via 70pin board to board connector between main PCB and Keypad FPCB.

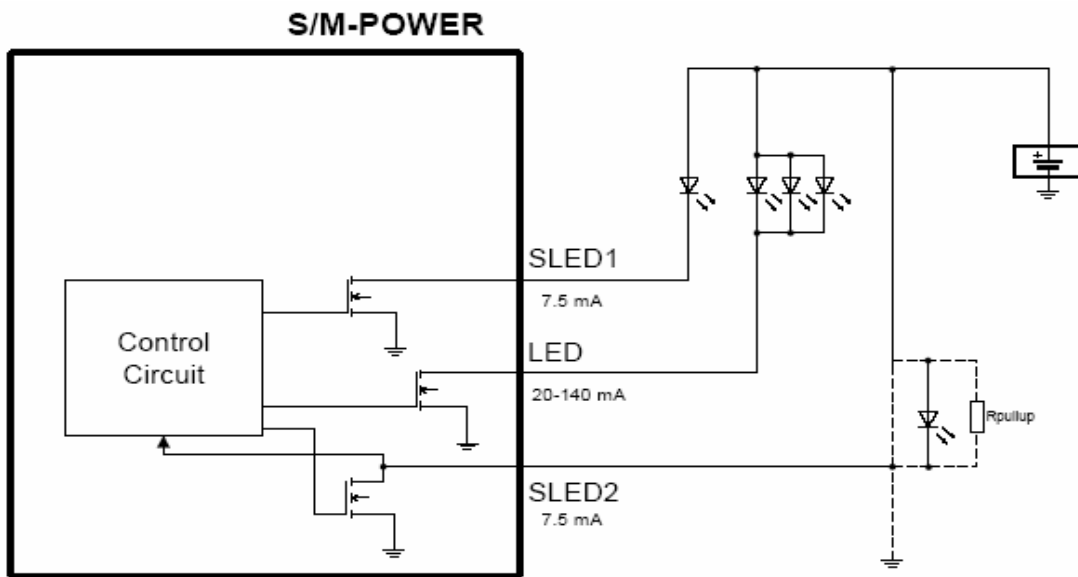


### 3. TECHNICAL BRIEF

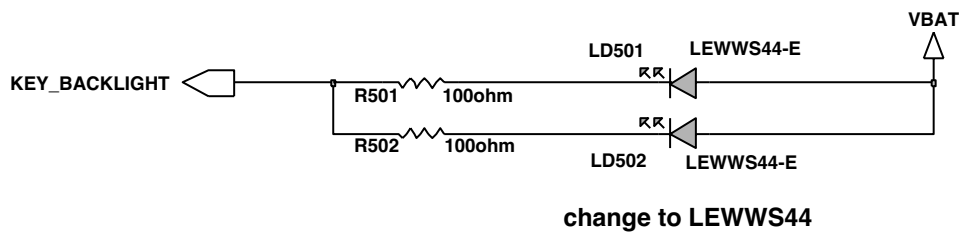
#### 3.9. Keypad back-light illumination

There are 2 snow white color LEDs on the KEY FPCB for keypad illumination. Keypad Back-light is controlled by SM-Power LED port which has constant current control function.

The whole configuration of the SM-POWER LED drivers is shown in below Figure16.



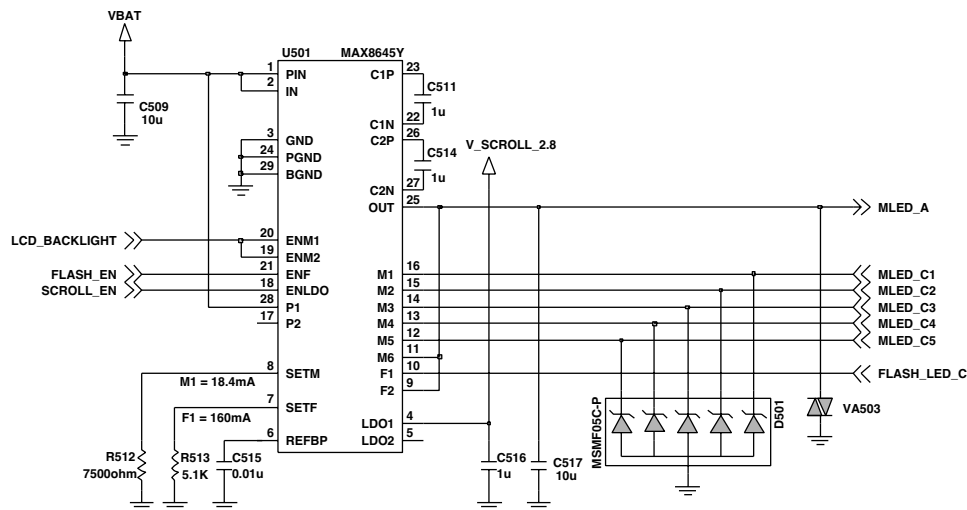
**Figure 13 Keypad Back-light LEDs**



**Figure 14 Keypad Back-light LEDs**

### 3.10. LCD back light illumination

The MAX8645Y charge pump drives up to 6 white LEDs in the main display for backlighting and up to 2 white LEDs for flash, all with regulated constant current for uniform intensity. By utilizing adaptive 1x/1.5x/2x charge pump modes and very-low-dropout current regulators, it achieves high efficiency over the 1-cell lithium-battery input voltage range. 1MHz fixed-frequency switching allows for tiny external components and low input ripple. Two on-board 200mA programmable output voltage LDOs are provided to meet camera module requirements.

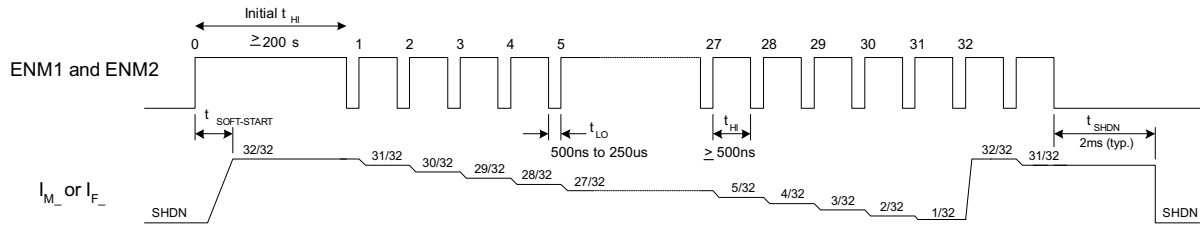


**Figure 15 LCD Back light unit and Flash LED charge pump IC**

For more dimming flexibility or to reduce the number of control traces, the MAX8645Y supports serial pulse dimming. Connect ENM1 and ENM2 together to enable single-wire pulse dimming of the main LEDs (or ENF only for single-wire pulse dimming of the Flash LEDs). When ENM1 and ENM2 (or ENF) go high simultaneously, the main (or flash) LEDs are enabled at full brightness. Each subsequent low-going pulse (500ns to 250µs pulse width) reduces the LED current by 3.125% (1/32), so after one pulse the LED current is 96.9% (or 31/32) \* I<sub>LED</sub>. The 31st pulse reduces the current to 0.03125 x I<sub>LED</sub>. The 32nd pulse sets the LED current back to I<sub>LED</sub>. Figure 1 shows a timing diagram for single-wire pulse dimming.

Because soft-start is longer than the initial t<sub>HI</sub>, apply dimming pulses quickly upon startup (after initial t<sub>HI</sub>) to avoid LED current transitioning through full brightness.

### 3. TECHNICAL BRIEF



**Figure 16 Seiral pulse dimming timing diagram**

#### Setting the Main Output Current

SETM controls M1-M6 regulation current. Current flowing into M1, M2, M3, M4, M5, and M6 is a multiple of the current flowing out of SETM.

$$I_{M1}=I_{M2}=I_{M3}=I_{M4}=I_{M5}=I_{M6} = K * (0.6V / R_{SETM}) = 18.4mA$$

where  $K = 230$ ,  $R_{SETM} = 7500$

where  $K = 23, 69$ , or  $230$  (depending upon the state of ENM1 and ENM2, see Table 8), and  $R_{SETM}$  is the resistor connected between SETM and GND (see the Typical Operating Circuit).

Table 8. ENM1/ENM2 current setting table

ENM1/ENM2 STATES	BRIGHTNESS	M1 - M6 CURRENT
ENM1 = low, ENM2 = low	Shutdown	0
ENM1 = low, ENM2 = high	1/10 Brightness	$23 \times I_{SETM}$
ENM1 = high, ENM2 = low	3/10 Brightness	$69 \times I_{SETM}$
ENM1 = high, ENM2 = high	Full Brightness	$230 \times I_{SETM}$

#### Setting the Flash Output Current

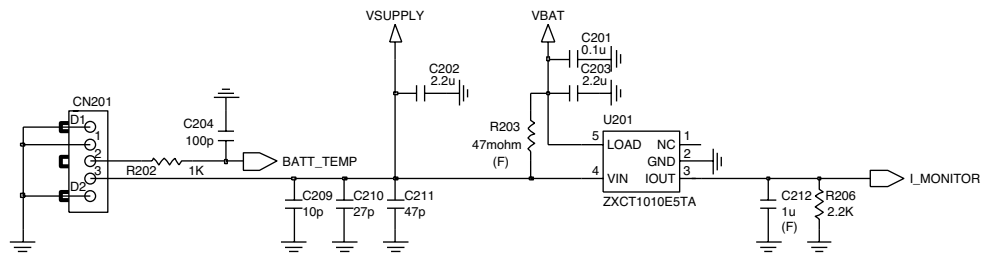
SETF controls the F1-F2 regulation current. Current flowing into F1 and F2 is a multiple of the current flowing out of SETF.

$$I_{F1}=I_{F2} = N * (0.6V / R_{SETF}) = 162mA$$

where  $N = 1380$ ,  $R_{SETF} = 5100$

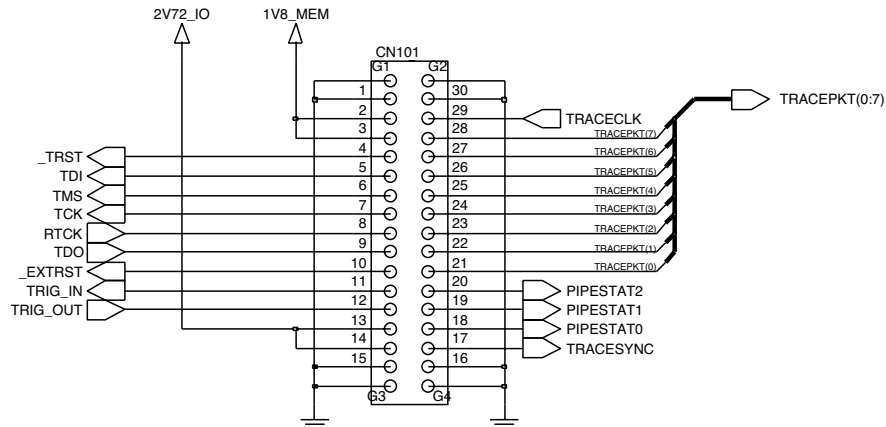
### 3.11 Battery current consumption monitor

KE970 use a current monitoring function to calculate the battery capacity and the remaining time, as monitoring current flow from the battery thru 47mohm resistor.



**Figure 17 Current monitor circuit**

### 3.12 JTAG & ETM interface connector



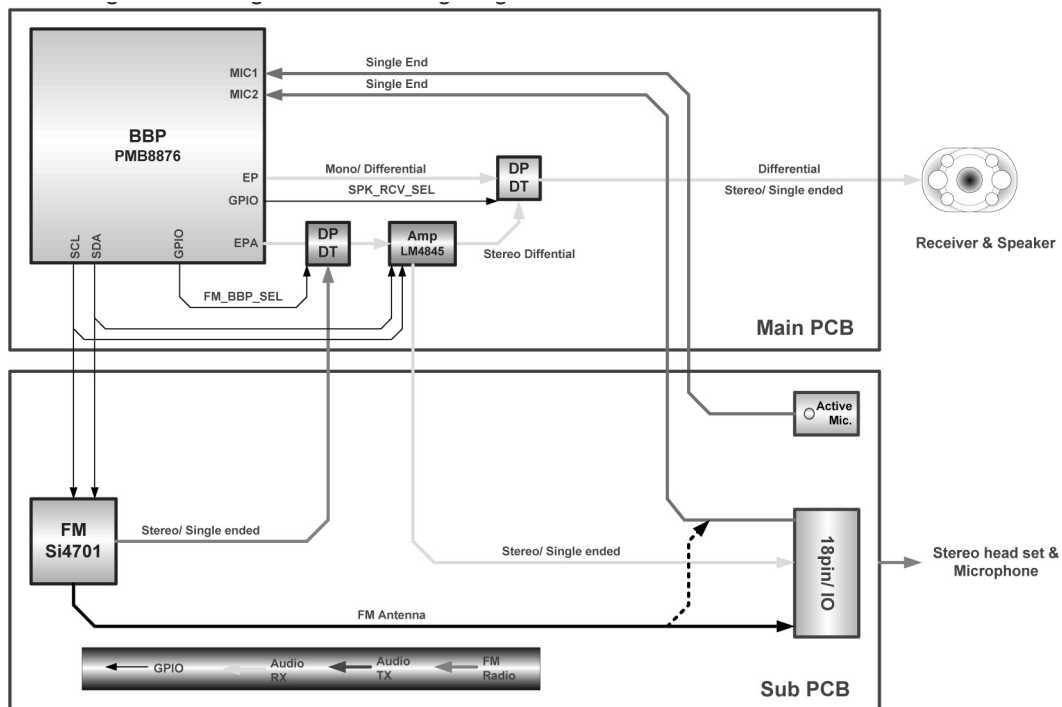
**Figure 18 JTAG & ETM(Embedded Trace Module) interface connector**

In case of KE970 mass production, the JTAG & ETM interface connector will not be mount on board. That is only for developing and software debugging purpose.

### 3. TECHNICAL BRIEF

#### 3.13. Audio

KE970 Audio signal flow diagram as following diagram.



**Figure 19 Audio signal flow diagram**

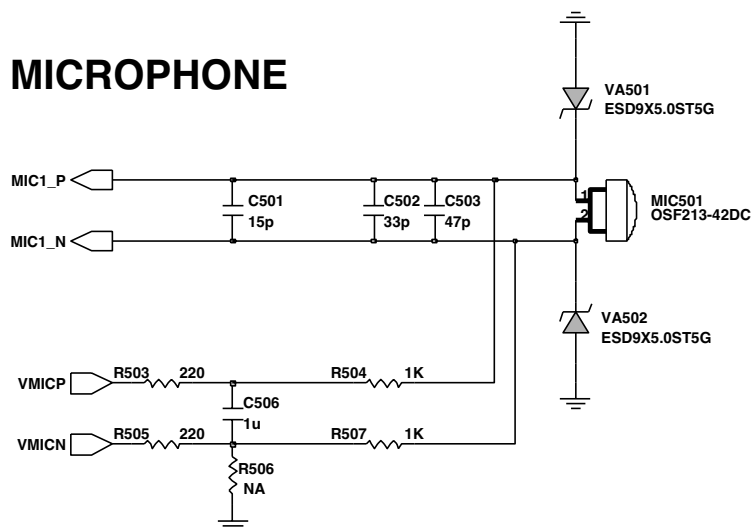
Audio amplifier sub system IC is an audio power amplifier capable of delivering 500mW of continuous average power into a mono 8Ω load, 25mW per channel of continuous average power into stereo 32Ω single-ended (SE) loads. The LM4845 features a 32-step digital volume control and eight distinct output modes. The digital volume control, 3D enhancement, and output modes (mono/SE/OCL) are programmed through a two-wire I2C interface that allows flexibility in routing and mixing audio channels.



### 3. TECHNICAL BRIEF

#### 3.13.2. Microphone with gain switching circuit

When a call is established, MICBIAS signal goes up to '2.5V' in the MKE970. PMB8876(S-Gold2) provides both 2.0V and 2.5V for MICBIAS to circuit designer. VA01, VA02 are employed to enhance ESD immunity.



**Figure 22 Microphone circuit**

#### 3.14. Multi port switch

Multi port switch has employed to decrease MMI(Multi Media Interface) connector's pin number. USB, USART, Remote controlled Headset is connected via this multi port switch. When USB VBUS voltage is detected Multi port 0 and 1 is connected to USB\_DP and USB\_DM each. If the remote controlled headset is plugged into MMI connector, then multi port 0 and 1 in go through REMOTE\_INT and REMOTE\_ADC.

Table 9 Multi port switch truth table

	VBUS_USB='L'	VBUS_USB='L'	VBUS_USB='H'
	JACK_DETECT='L'	JACK_DETECT='H'	
Pin6	REMOTE_INT	TXD	USB_DP
Pin7	REMOTE_ADC	RXD	USB_DM





### 3. TECHNICAL BRIEF

#### 3.15. USB charging circuit

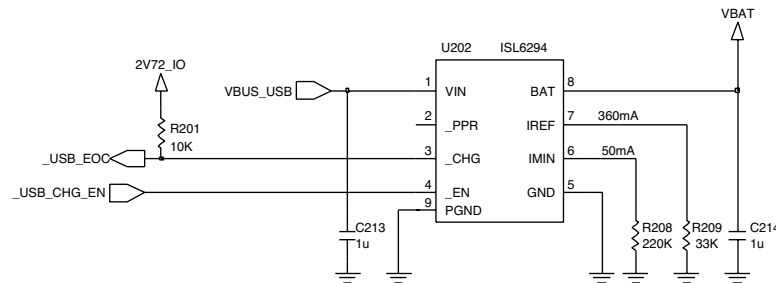
The USB charging circuit is a fully integrated USB VBUS voltage single-cell Li-ion battery charger circuit.

The charger uses a CC/CV charge profile required by Li-ion batteries. CC charging current and End of charging current is programmable  $I_{REF}$  &  $I_{MIN}$  resistors.  $I_{REF}$  resistor between this pin and the GND pin to set the charge current limit determined by the following equation:

$$I_{CC} = 12089/33K = 366mA$$

The End Of Charging current is set by  $I_{MIN}$  That can be programmed by the as following equation:

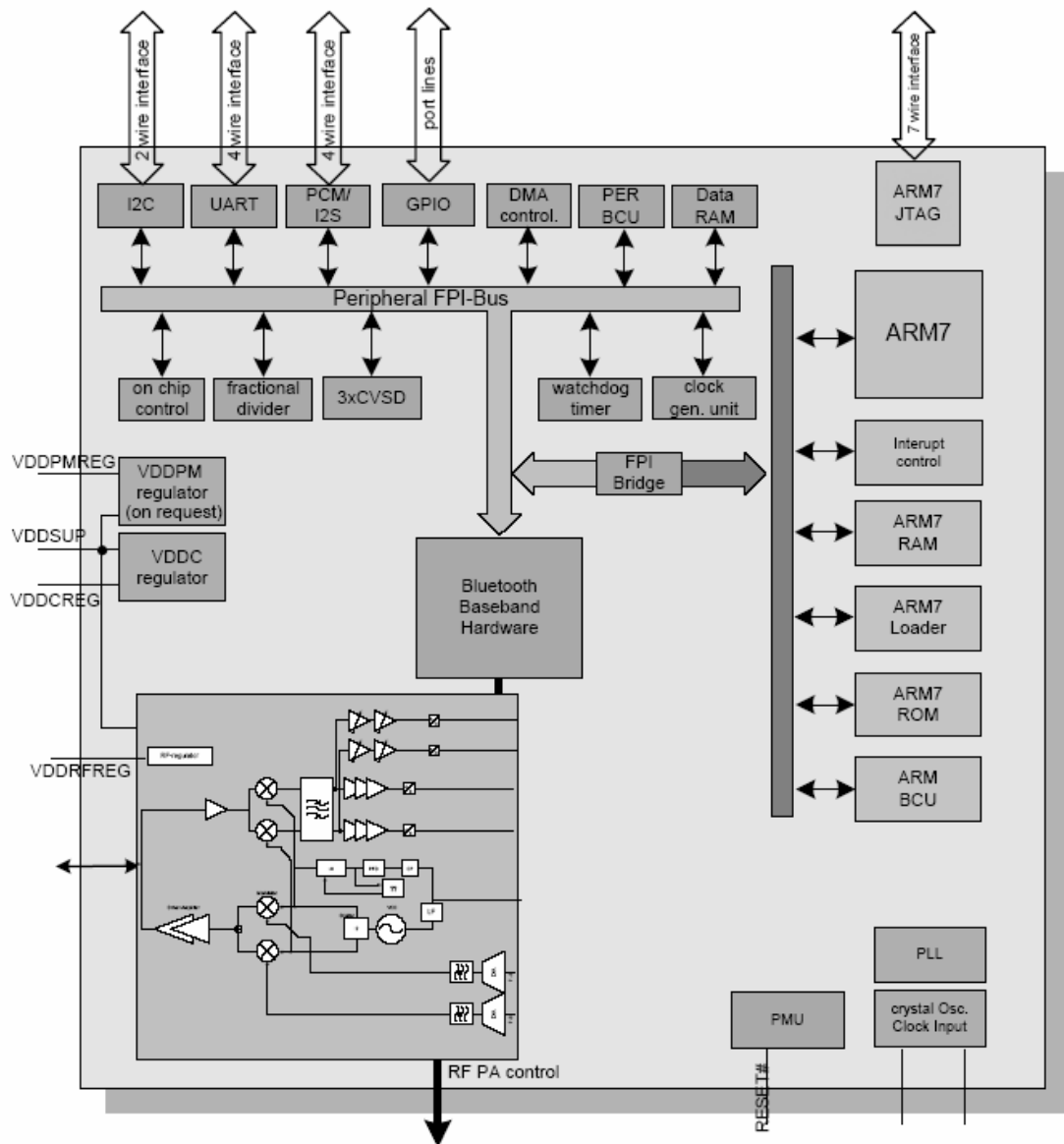
$$I_{EOC} = 11000/220K = 50mA$$



**Figure 25 USB charging circuit**

Charging indicator LED controlled by two ICs, one is a SM-Power, the other is a ISL6294. When TA(Travel Charger) is plugged in to MMI connector, the LD100 controlled by SM-Power both power off case and power on case. When USB cable is connected via MMI connector, indicator LED is controlled by ISL6294 in power off case and by SM-Power in power on case.

#### 3.16. BLUETOOTH



**Figure 26 BLUETOOTH Functional block diagram.**

## 3. TECHNICAL BRIEF

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### 3.16.1. General Features

- Single Chip Bluetooth device for cellular applications integrating radio, baseband and memory
- Fabricated in advanced low power 0.13µm CMOS technology
- Very low component count (6 external components)
- Ultra low power design
  - Peak current 40mA for basic data rate
  - Peak current 45mA for enhanced data rate
  - Bluetooth low power mode typ. 25µA
- Multiple input clock signals supported (10-40MHz)
- Supply from external voltage regulator 1.8V..3.6V 1)
- Autonomous power down scenarios of Bluetooth and cellular system supported
- Packages:
  - P-VQFN-48 package
  - P-WFLGA-56 package
- Temperature range from -40°C up to 85°C
- Boundary scan for interface lines via JTAG

### 3.16.2 Micro-Controller-Section

- ARM7TDMI-STMicro ARM® Processor for protocol and application software
- Timers + Watchdog + Interrupt Module

### 3.16.3 Micro-Controller Memory

- 32 KByte RAM
- 256 KByte read only Program Memory
- 8 KByte Patch RAM

### 3.16.4 Interfaces

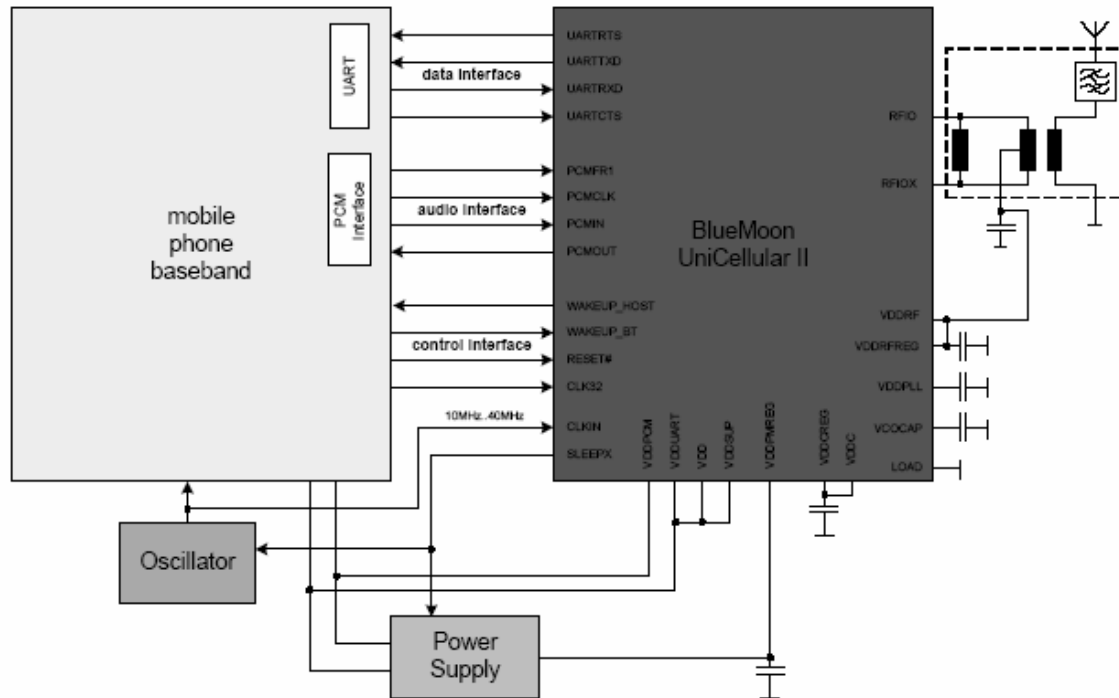
- UART (Bluetooth - Interface, support for HCI UART and Three-Wire UART transport layers with/without hardware handshaking) up to 3.25Mbaud
- Two channel PCM Audio interface with I2S mode
- I2C Interface
- Three channel full duplex CVSD trans coder
- General Purpose I/Os
  - External interrupt
  - Port output levels available during low-power mode (VDD supplied)
- Separate voltage domains for GPIO, UART and PCM interfaces
- Control signal for requesting external (cellular) system clock
- Multi frequency (e.g. 32.768 kHz) low power clock input

### 3.16.5. RF-Section

- Integrated antenna switch to minimize external components count
- Programmable RF transmit power between -55dBm...+6dBm
  - Fine tuning in 2dB programmable steps also supported
- 20dBm power class 1 supported with external power amplifier
  - Separate TX output interface to PA (bypass of internal T/R switch)
  - Digital power step control
- Receiver sensitivity typ. -90dBm
- High performance integrated LNA with excellent blocking and inter modulation performance
- Low-IF receiver topology eliminates external IF filters
- Digital demodulation for optimum sensitivity and co- / adjacent channel performance
  - Digital offset compensation, symbol and frame synchronization
- RSSI information for power control

### 3. TECHNICAL BRIEF

#### 3.16.6 System Integration



**Figure 27 Mobile system integraton**

The UART (serial interface) is used for the software interface between S-Gold2 baseband and the Bluetooth chip. For the HCI UART transport layer four interface lines are needed, two for data (UARTTXD and UARTRXD) and two for hardware flow control (UARTRTS and UARTCTS). For the HCI Three-Wire UART transport layer two interface lines (UARTTXD and UARTRXD) are needed. The hardware flow control lines (UARTRTS and UARTCTS) are supported but the use is optional. In KE970 used three-wire UART communication.

The UART interface has its own supply voltage (VDDUART) to ensure compatibility with the I/O voltages used by the S-Gold2.

The PCM/I2S interface is used as audio interface and can handle up to two voice channels. The PCM interface also has its own supply voltage (VDDPCM) to ensure compatibility with the I/O voltages used by the S-Gold2 baseband processor.



### 3.17. Micro SD external memory card slot

The TransFlash Memory Module has eight exposed contacts on one side. The S-Gold2 is connected to the module using a dedicated eight-pin connector

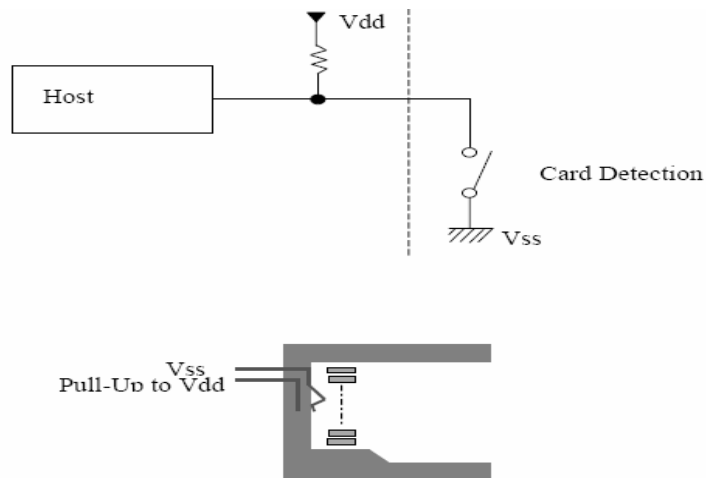


### **Figure 29 Micro SD pin assignment**

### 3. TECHNICAL BRIEF

Table 10 Micro SD memory pad assign.

SD mode			
Pin No.	Name	Type	Description
1	DAT2	I/O	Data bit [2]
2	CD/DAT3	I/O	Data bit [3]
3	CMD	I/O	Command response
4	VDD	Power	Power supply
5	CLK	I	Clock
6	VSS	Ground	Power ground
7	DAT0	I/O	Data bit [0]
8	DAT1	I/O	Data bit [1]



**Figure 30 Micro SD memory card detection scheme**

Table 11 Micro SD memory card detect truth table.

	Micro SD card status	
	it is removed	it is inserted
TF_DETECT	High	Low

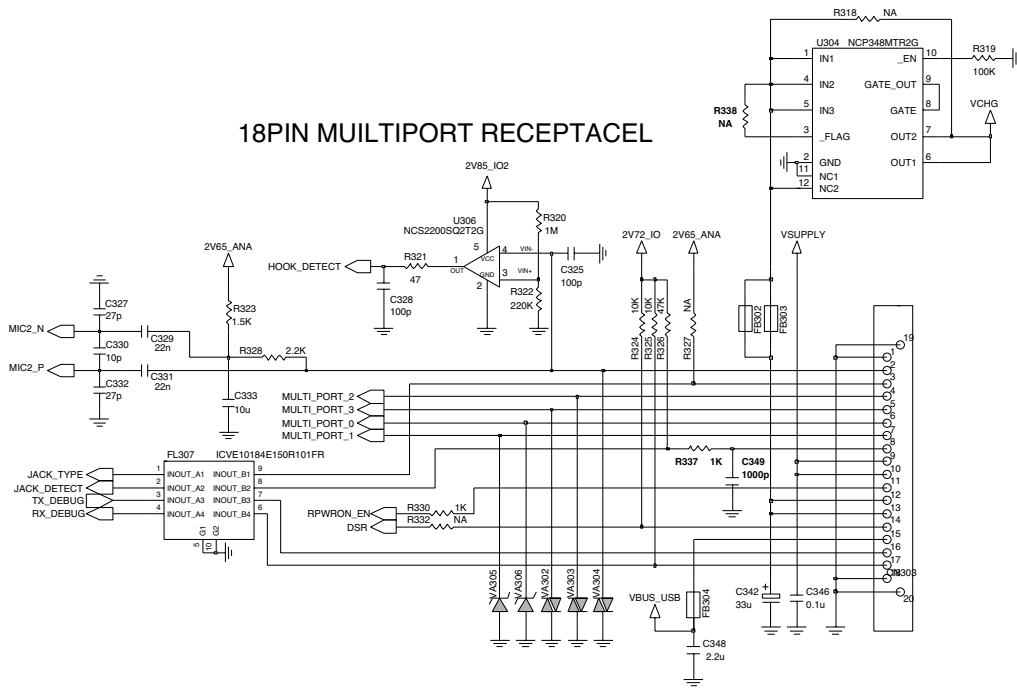


### Table 12 Multi media interface pin assign

- 57 -



### 3. TECHNICAL BRIEF

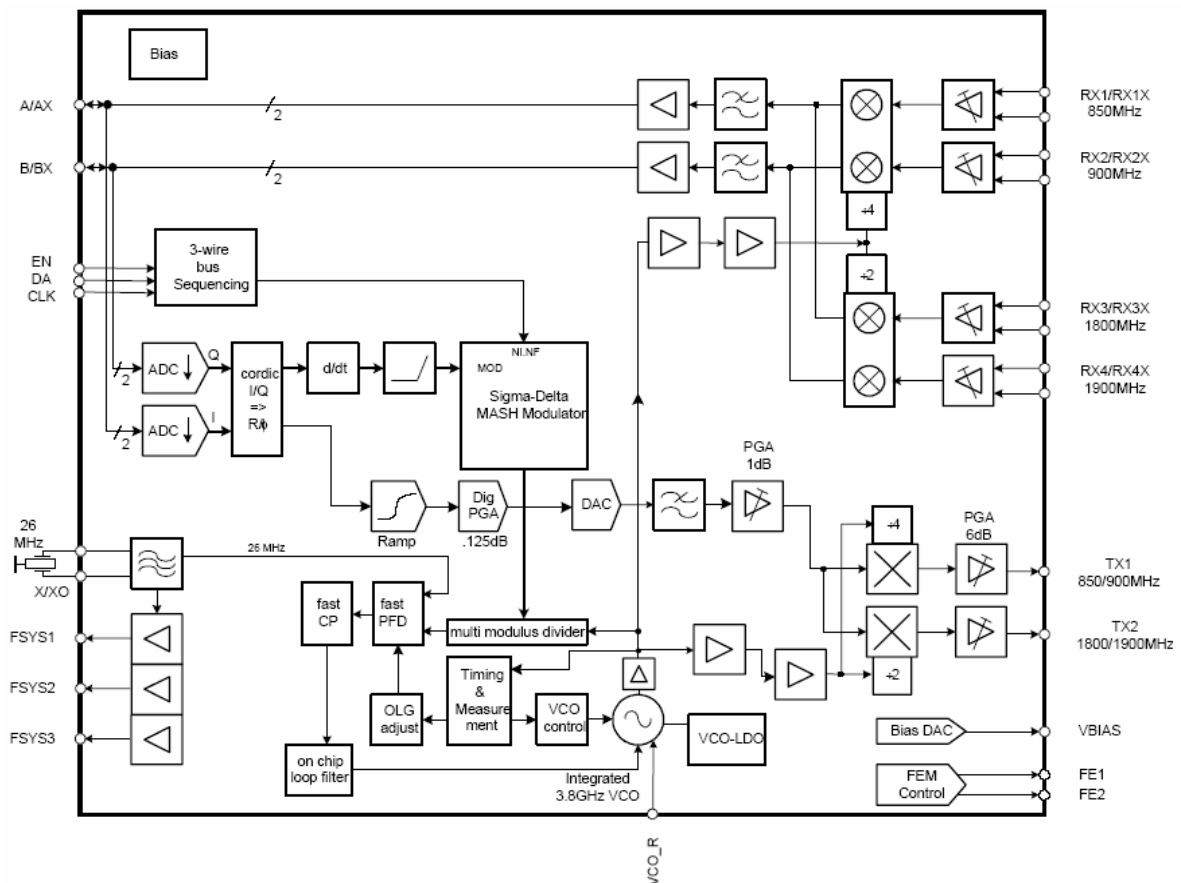


**Figure 32 MMI 18pin connector circuit**

### RF circuit technical brief

#### 3.19. General Description

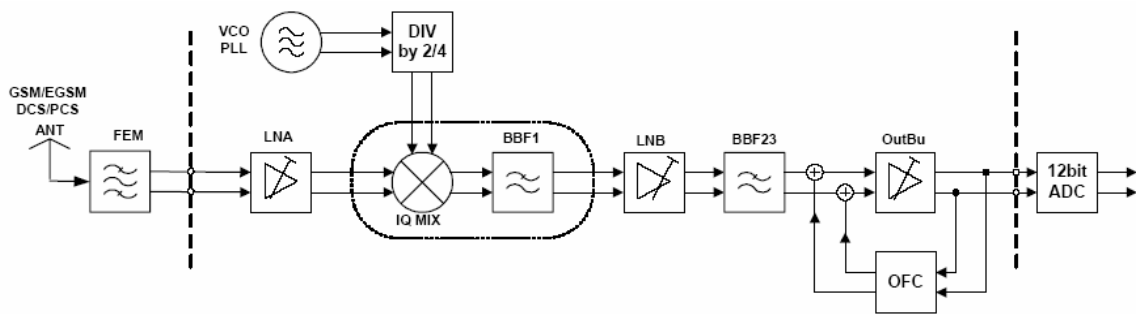
The RF transceiver (PMB 6272 SMARTi-PM) is an integrated single chip, quad-band transceiver for GSM850/GSM900/GSM1800/GSM1900 designed for voice and data transfer applications. The transceiver provides an analog I/Q baseband interface and consists of a direct conversion receiver and a quad-band polar transmitter for GSM and EDGE with integrated PGA functionality. Further on a completely integrated SD-synthesizer with HSCSD and GPRS/EDGE capability, a digitally controlled reference oscillator with three outputs, a fully integrated quad-band RF oscillator and a three wire bus interface with all necessary control circuits complete the transceiver.



**Figure 33 RF transceiver PMB7262 SMARTi-PM functional block diagram**



#### 3.20. Receiver part



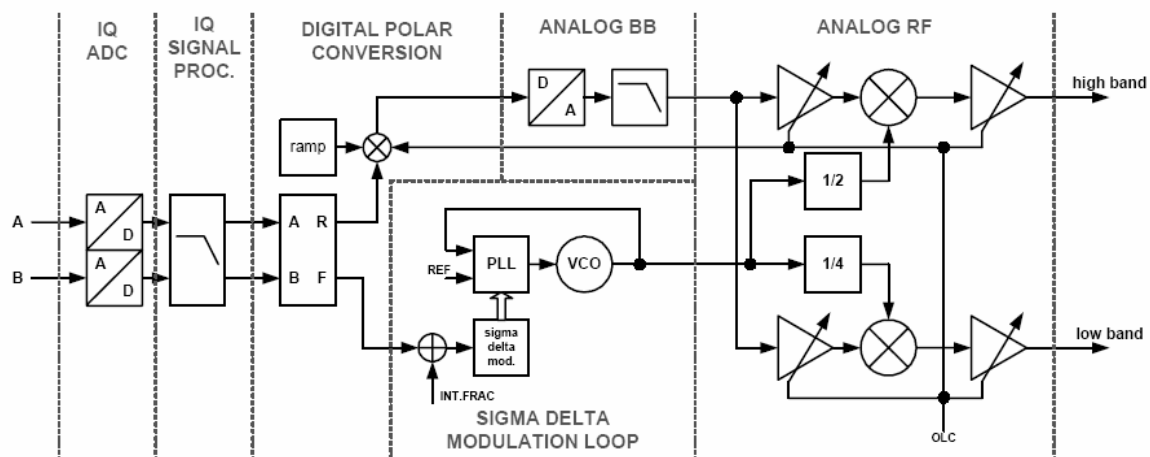
**Figure 35 Receiver part block diagram**

The constant gain direct conversion receiver contains all active circuits for a complete receiver chain for GSM/GPRS/EDGE (see Figure 39). The GSM850/900/DCS1800/ PCS1900 LNAs with balanced inputs are fully integrated. No inter-stage filtering is needed. The orthogonal LO signals are generated by a divider-by-four for GSM850/900 band and a divider-by-two for the DCS1800/PCS1900 band. Down conversion to baseband domain is performed by low/high band quadrature direct down conversion mixers. The baseband chain contains a LNB (low noise buffer), channel filter, output buffer and DC-offset compensation. The 3rd order low pass filter is fully integrated and provides sufficient suppression of blocking signals as well as adjacent channel interferers and avoids anti-aliasing through the baseband ADC. The receive path is fully differential to suppress on-chip interferences. Several gain steps are implemented to cope with the dynamic range of the input signals. Depending on the baseband ADC dynamic range, single- or multiple gain step switching schemes are applicable. Furthermore an automatic DC-offset compensation can be used (depending on the gain setting) to reduce the DC-offset at baseband-output. A programmable gain correction can be applied to correct for front end- and receiver gain tolerances.

### 3. TECHNICAL BRIEF

#### 3.21. Transmitter part

The GMSK transmitter supports power class 4 for GSM850 and GSM900 as well as power class 1 for DCS1800 and PCS1900. The digital transmitter architecture is based on a very low power fractional-N Sigma-Delta synthesizer without any external components (see Figure39). The analog I/Q modulation data from the baseband is converted to digital, filtered and transformed to polar coordinates. The phase/frequency signal is further on processed by the Sigma-Delta modulation loop. The output of its associated VCO is divided by four or two, respectively, and connected via an output buffer to the appropriate single ended output pin. This configuration ensures minimum noise level. The 8PSK transmitter supports power class E2 for GSM850 and GSM900 as well as for DCS1800 and PCS1900. The digital transmitter architecture is based on a polar modulation architecture, where the analog modulation data (rectangular I/Q coordinates) is converted to digital data stream and is subsequently transformed to polar coordinates by means of a CORDIC algorithm. The resulting amplitude information is fed into a digital multiplier for power ramping and level control. The ready processed amplitude signal is applied to a DAC followed by a low pass filter which reconstructs the analog amplitude information. The phase signal from the CORDIC is applied to the Sigma-Delta fractional-N modulation loop. The divided output of its associated VCO is fed to a highly linear amplitude modulator, recombining amplitude and phase information. The output of the amplitude modulator is connected to a single ended output RF PGA for digitally setting the wanted transmit power. The PA interface of SMARTi-PM supports direct control of standard dual mode power amplifiers (PA's) which usually have a power control input VAPC and an optional bias



**Figure 36 Transmitter part block diagram**

control pin VBIAS for efficiency enhancement. In GMSK mode, the PA is in saturated high efficiency mode and is controlled via its VAPC pin directly by the baseband ramping DAC. In this way both up- / down-ramping and output power level are set. In 8PSK mode, the ramping functionality is assured by an on-chip ramping generator, whereas output power is controlled by the PGA's as described above.

### 3.22. RF synthesizer

The transceiver contains a fractional-N sigma-delta synthesizer for the frequency synthesis in the RX operation mode. For TX operation mode the fractional-N sigma-delta synthesizer is used as Sigma-Delta modulation loop to process the phase/frequency signal. The 26MHz reference signal is provided by the internal crystal oscillator. This frequency serves as comparison frequency of the phase detector and as clock frequency for all digital circuitry. The divider in the feedback path of the synthesizer is carried out as a multi-modulus divider (MMD). The loop filter is fully integrated and the loop bandwidth is about 100 kHz to allow the transfer of the phase modulation. The loop bandwidth is automatically adjusted prior to each slot (OLGA<sup>®</sup>). To overcome the statistical spread of the loop filter element values an automatic loop filter adjustment (ALFA) is performed before each synthesizer startup. The fully integrated quad-band VCO is designed for the four GSM bands (850, 900, 1800, 1900 MHz) and operates at double or four times transmit or receive frequency. To cover the wide frequency range the VCO is automatically aligned by a binary automatic band selection (BABS) before each synthesizer startup.

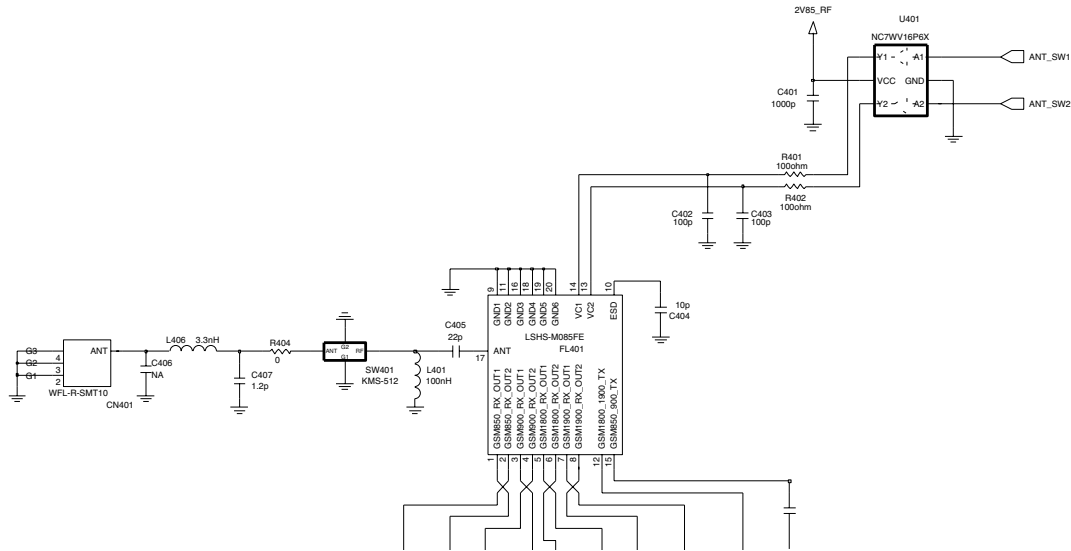
### 3.23. TCXO

The transceiver contains a fully integrated 26MHz temperature compensated controlled crystal oscillator (DCXO) with three outputs for the system clock, one output for the GSM baseband and two additional for other subsystems (GPS, Bluetooth, etc.). The only external part of the oscillator is the crystal itself. The overall pulling range of the TCXO consists of eight subranges. The subrange closest to the '0ppm' at the middle AFC-value is selected during the calibration process in the mobile's production and is used for the rest of the lifetime. The frequency tuning is performed along the selected subrange by programming the frequency control word (XO\_TUNE) via the three wire bus ("3Wbus").

### 3. TECHNICAL BRIEF

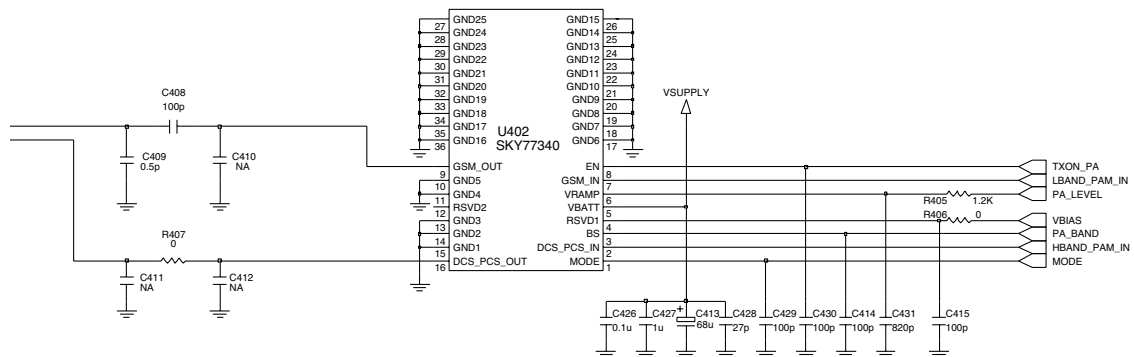
#### 3.24. Front End Module control

Implemented in the Transceiver are two outputs for direct control of front end modules with two logic input pins to select RX- and TX-mode as well as low- and high band operation.



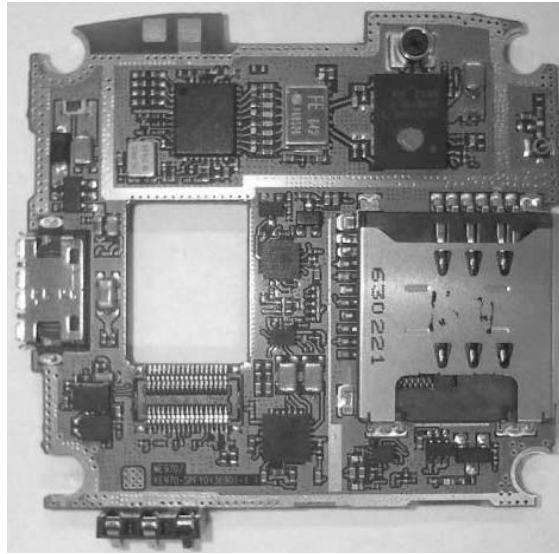
**Figure 37 FEM schematic**

#### 3.25. Power Amplifier Module

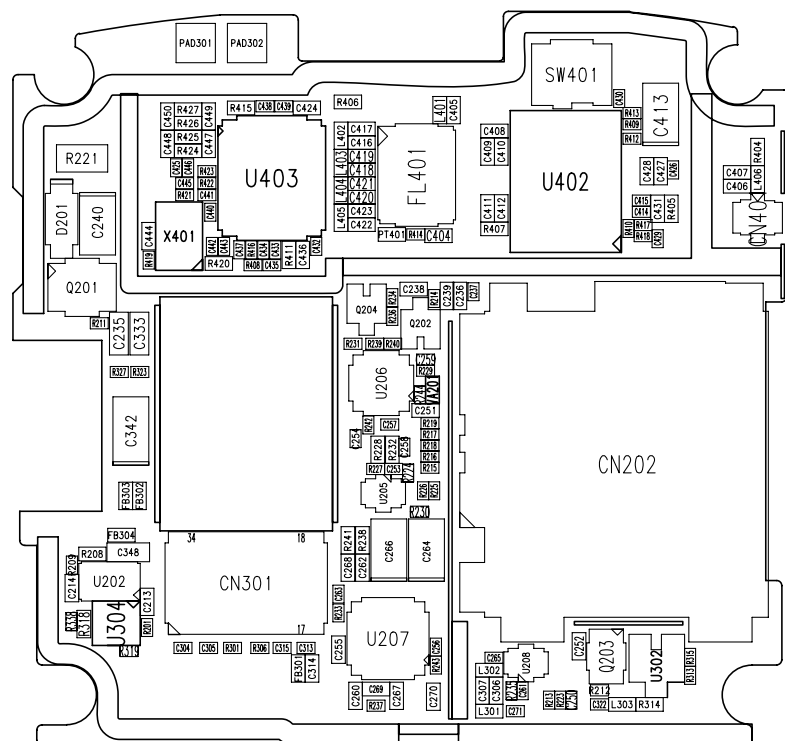


## 4. PCB layout

#### 4.1 Main & Sub PCB component placement



**Figure 39 Main PCB top**



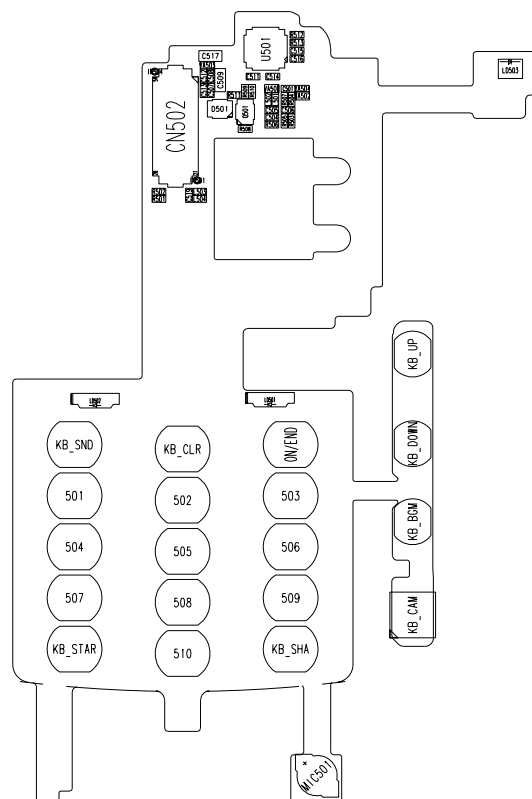
**Figure 40 Main PCB top placement**







**Figure 43 KEY FPCB top**



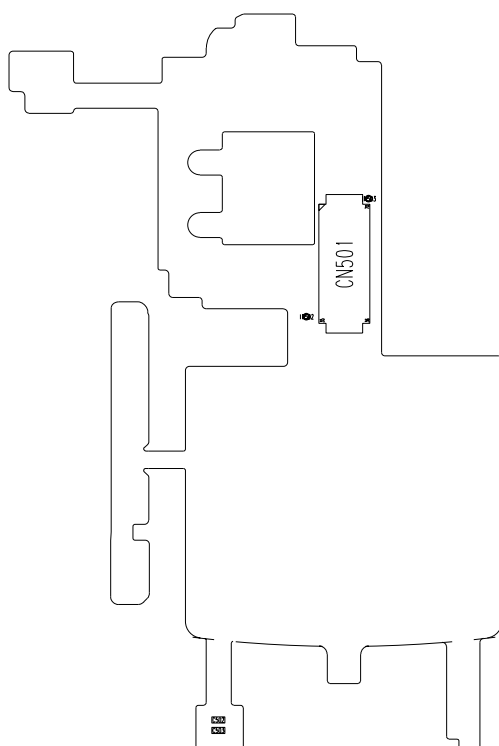
**Figure 44 KEY FPCB placement**

## 4. PCB layout

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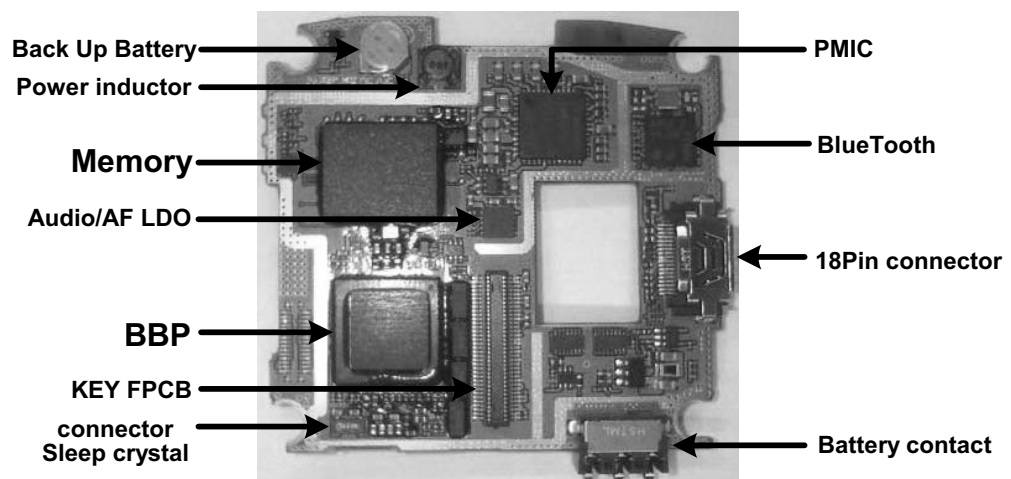
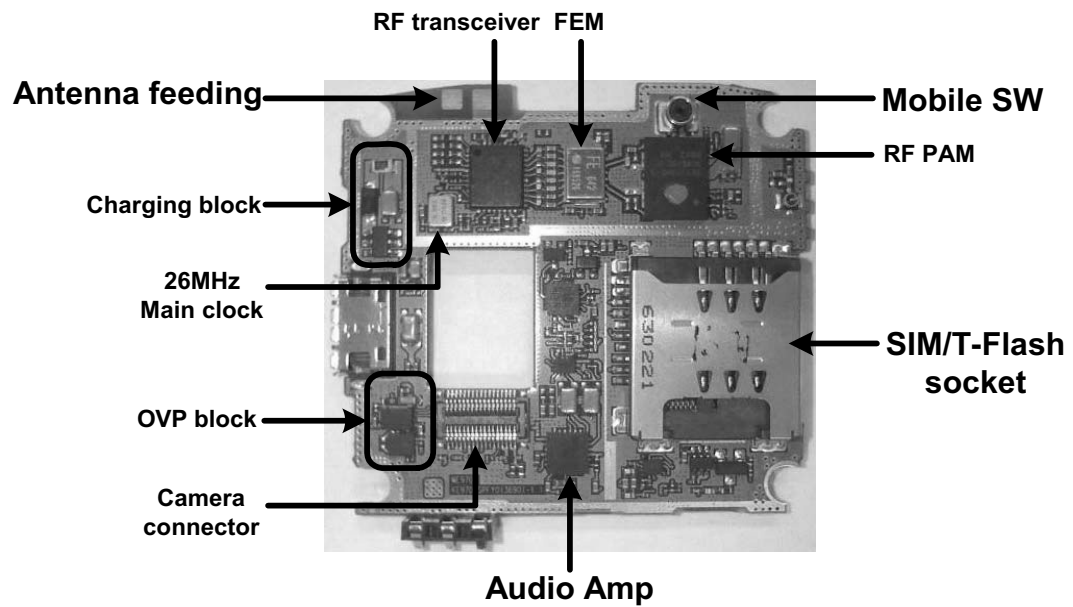


**Figure 45 KEY FPCB bottom**



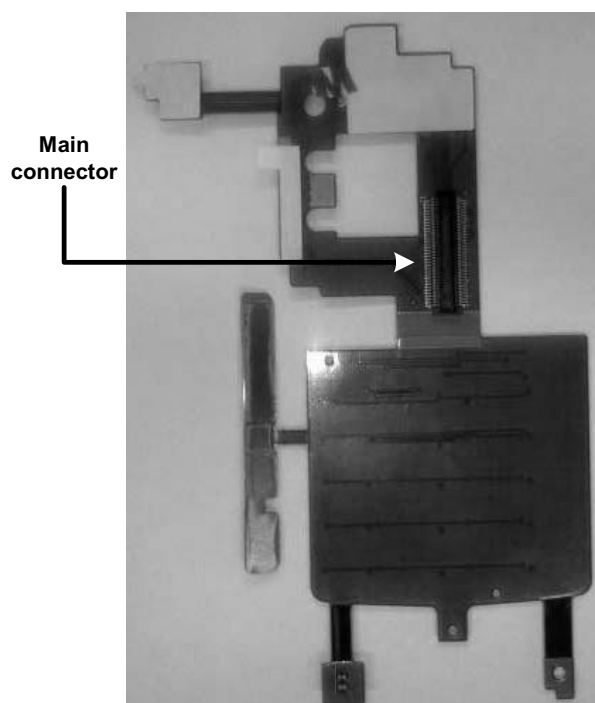
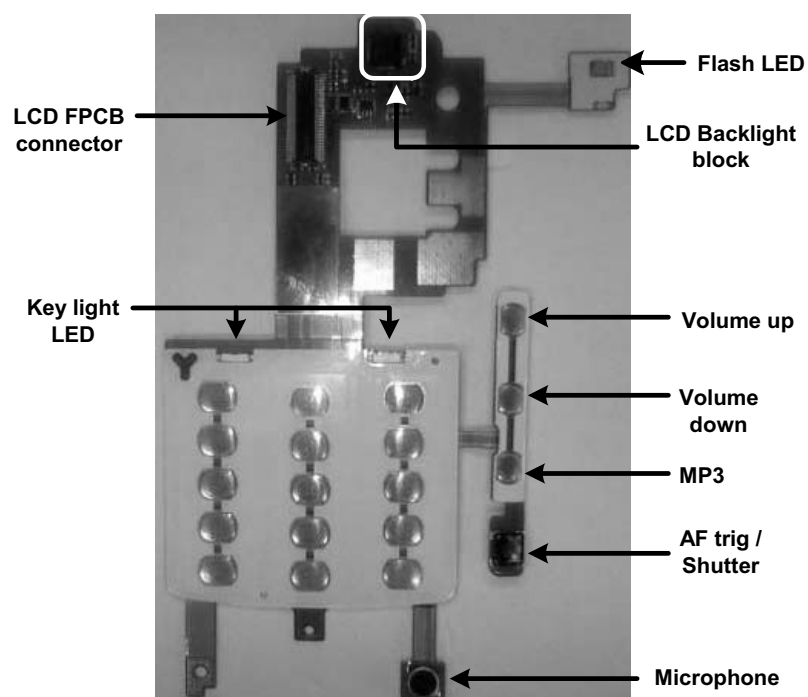
**Figure 46 KEY FPCB bottom placement**

## 4. PCB layout



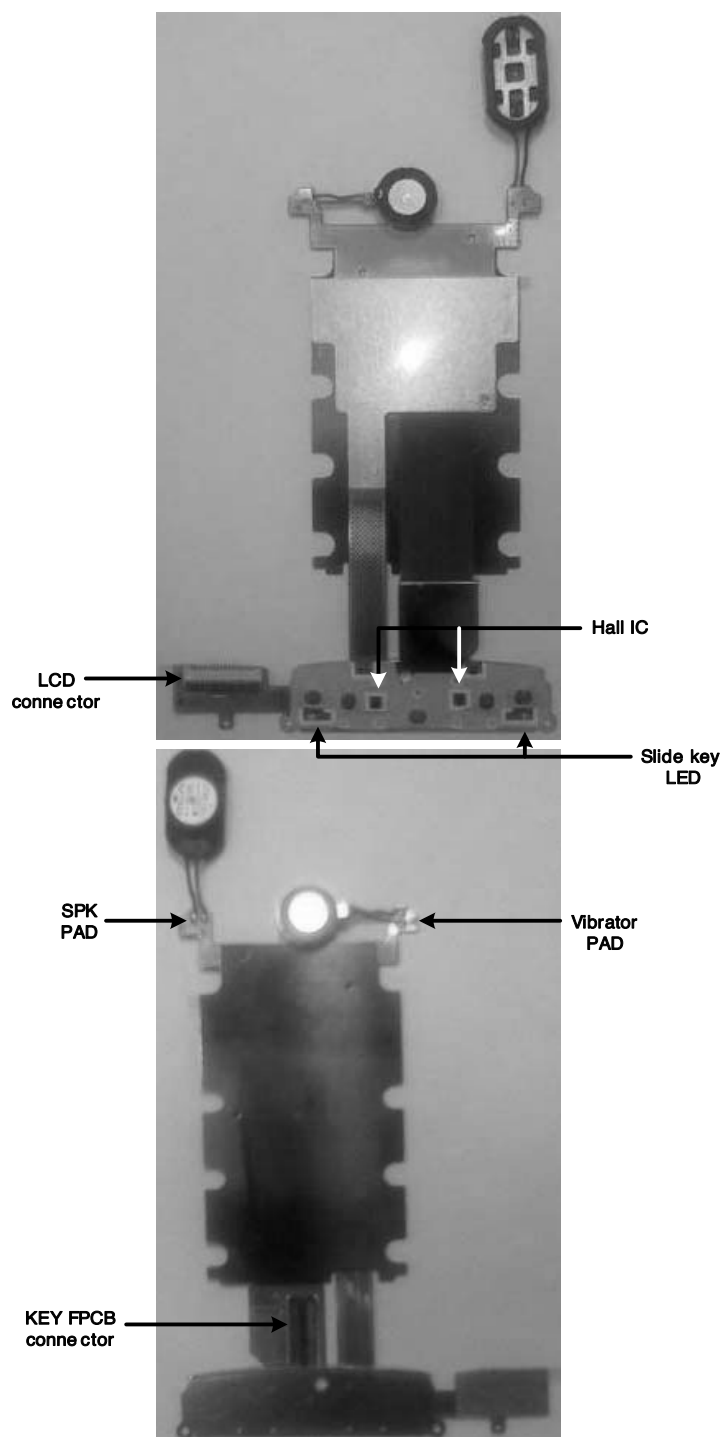
## 4. PCB layout

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## 4. PCB layout

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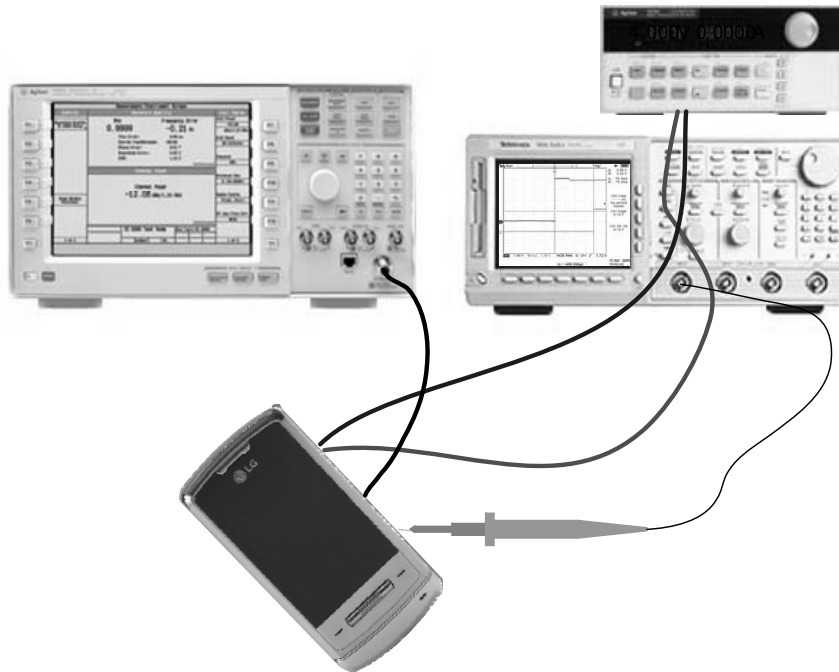


## 5. Trouble shooting

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## 5. Trouble shooting

### 5.1 Trouble shooting test setup



**Figure 51 Equipment setup**

Power on all of test equipment

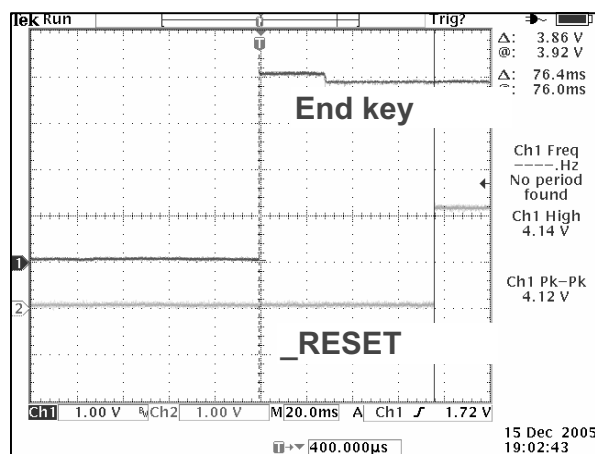
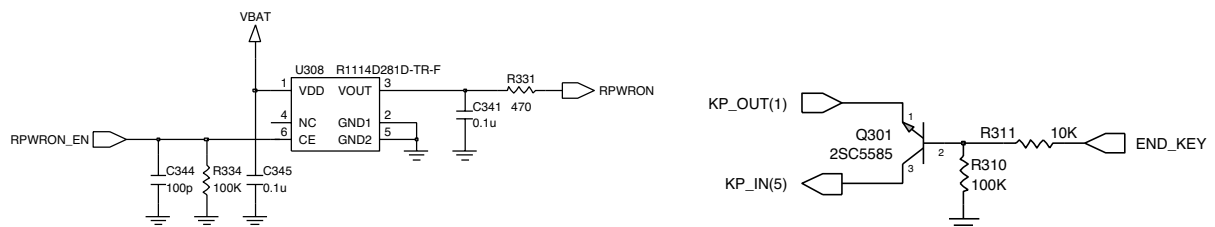
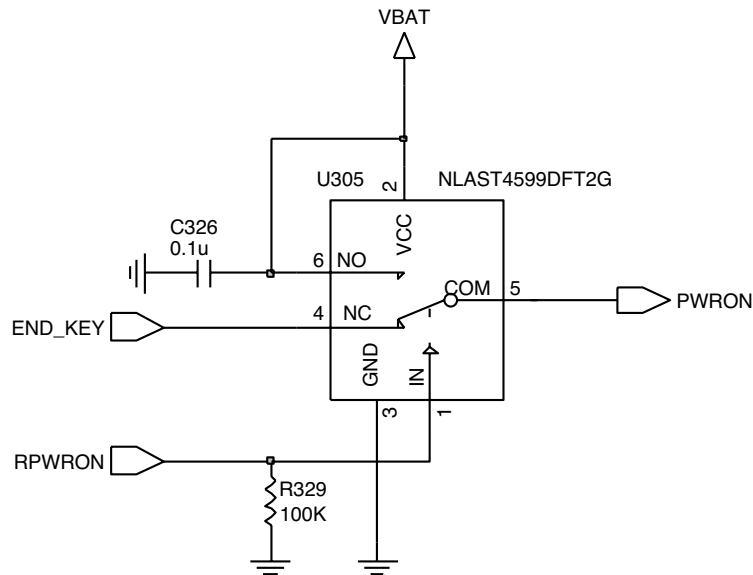
- Connect PIF-UNION JIG or dummy battery to the DUT for power up.
- Connect mobile switch cable between Communication test set and DUT when you need to make a phone call.
- Follow trouble shooting procedure

### 5.2 Power on Trouble

#### Check Points

- Battery Voltage( Need to over 3.35V)
- Power-On Key detection (PWRON signal)
- Outputs of LDOs from PMIC

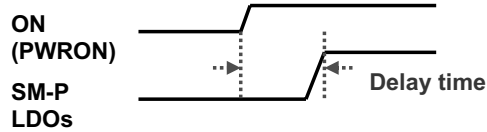
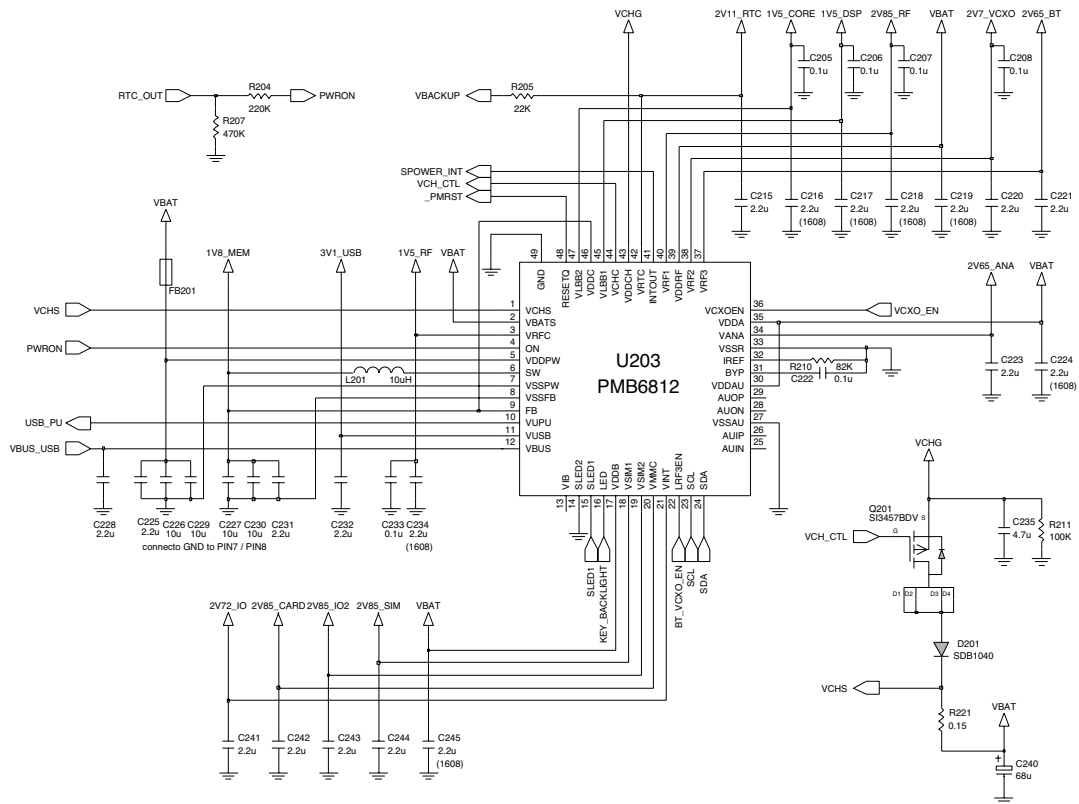
## 5. Trouble shooting





## 5. Trouble shooting

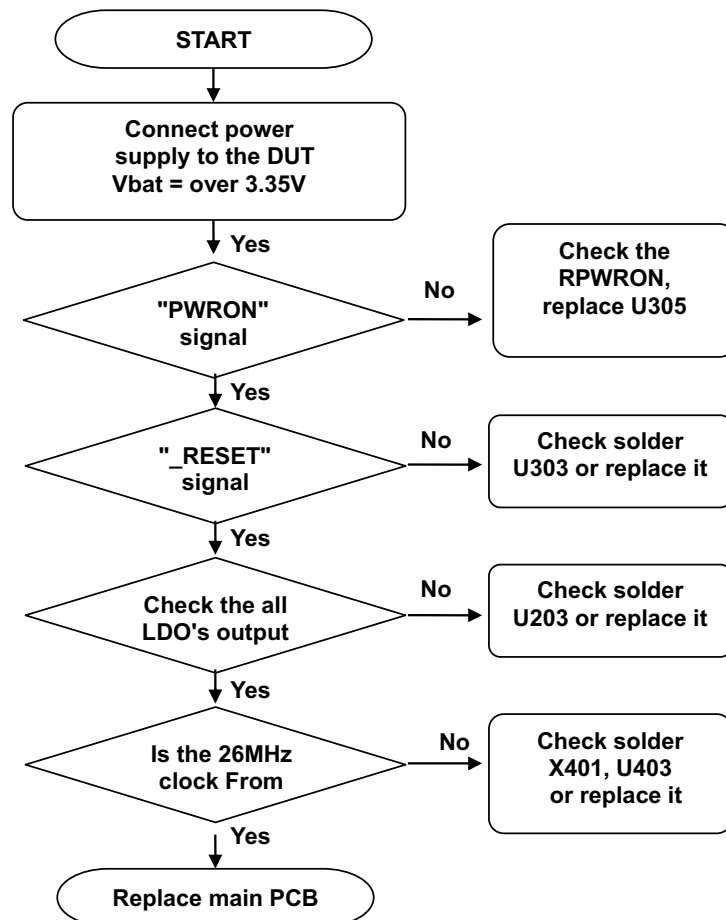
### PMIC & Li-ion CHARGER



SM-POWER LDOs	2V7_V CXO	1V8_MEM	1V5_CORE	1V5_DSP	2V72_IO	2V65_ANA	2V85_SIM	2V85_IO2	2V85_CARD	3V1_USB	1V5_RF	2V85_RF
LDO NAME	VRF2	VLB B2	SW(S DBB)	VLB B1	VINT	VANA	VSIM 1	VSIM 2	VMMC	VUS B	VRF C	VRF 1
Delay time(msec)	20	24.2	23.7	26.2	26.2	28.1	30.2	32.2	34.3	36.6	628	628

## 5. Trouble shooting

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## 5. Trouble shooting


### 5.3 Charging trouble


#### Check Points

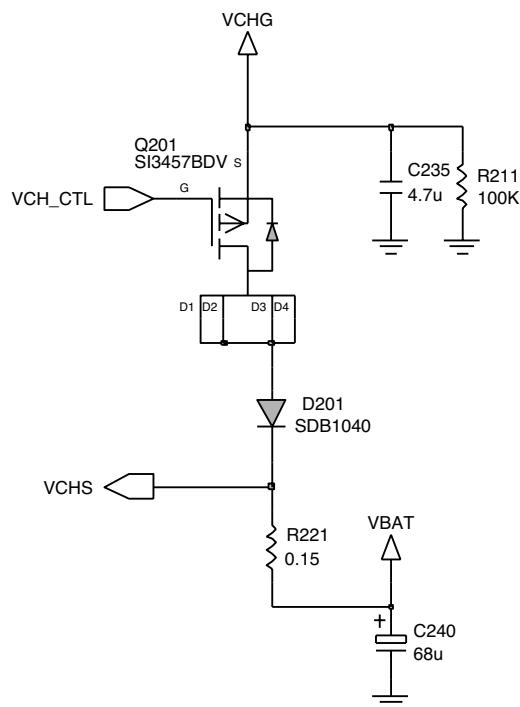
- Connection of TA (check TA voltage 4.8V)
- Charging Current Path component voltage drop
- Battery voltage
  - Charging method : CC-CV
  - Charger detect voltage : about 4.0V
  - Charging time : 3h under
  - Charging current : 500mA
  - Cutoff current : 100mA
  - Low battery alarm
    - . Idle : 3.62V
    - . Dedicated : 3.50V
- Switch-off voltage : 3.35V
- Charging temperature ADC range
  - ~ -20°C : small charging operation.
  - -20°C ~ 60°C : charging.
  - 60°C ~ : not charging operation small charging operation.

  
**4.2V~3.86V**

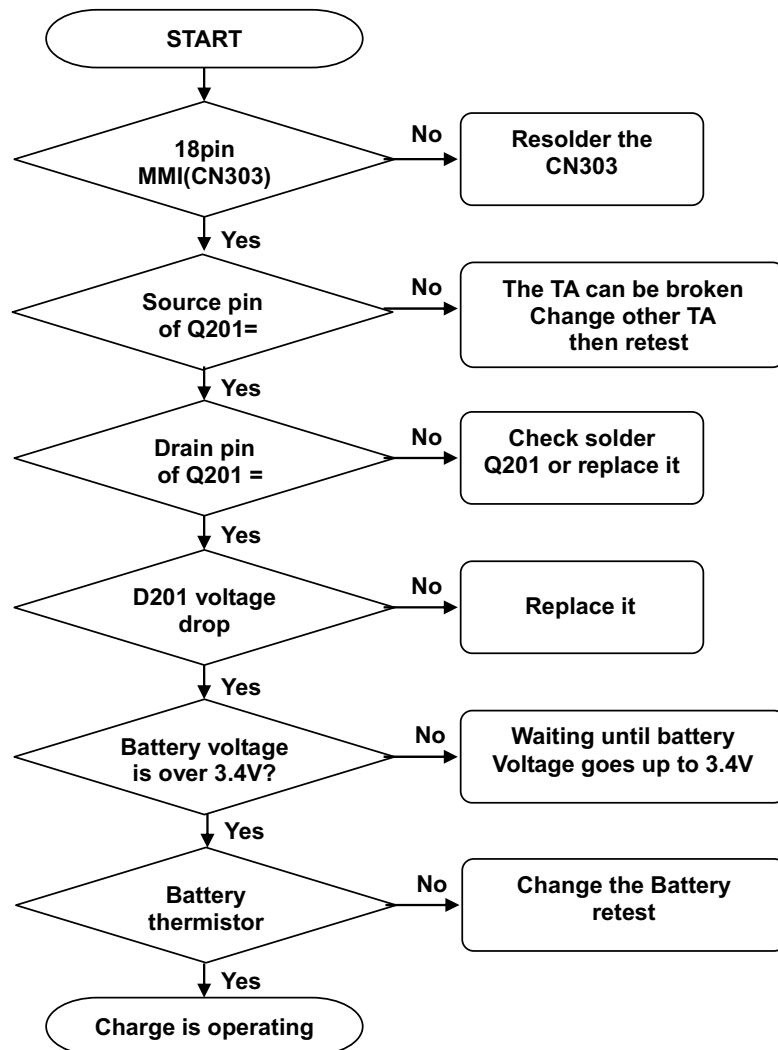
  
**3.85V~3.75V**

  
**3.75V~3.69V**

  
**3.69V~3.62V**



## 5. Trouble shooting

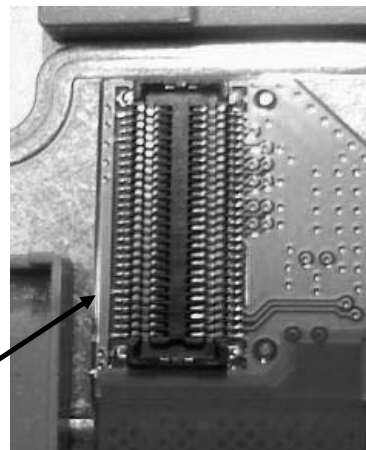
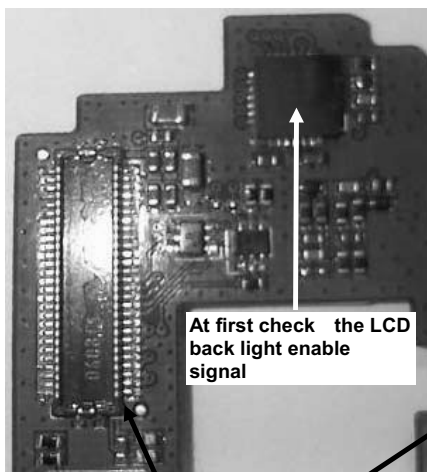
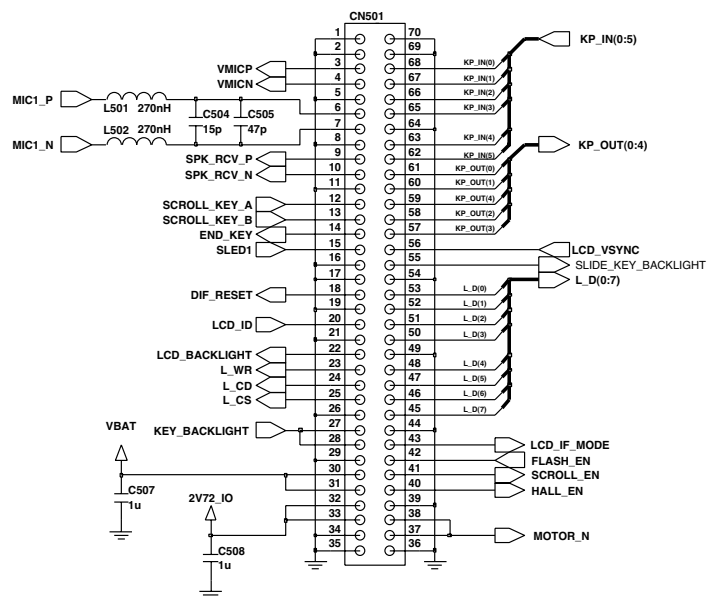


## 5. Trouble shooting

### 5.4 LCD display trouble

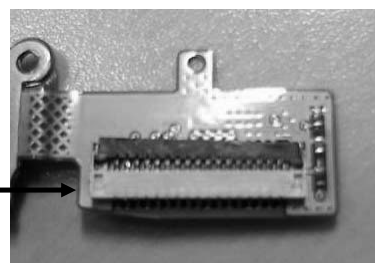
#### Check Points

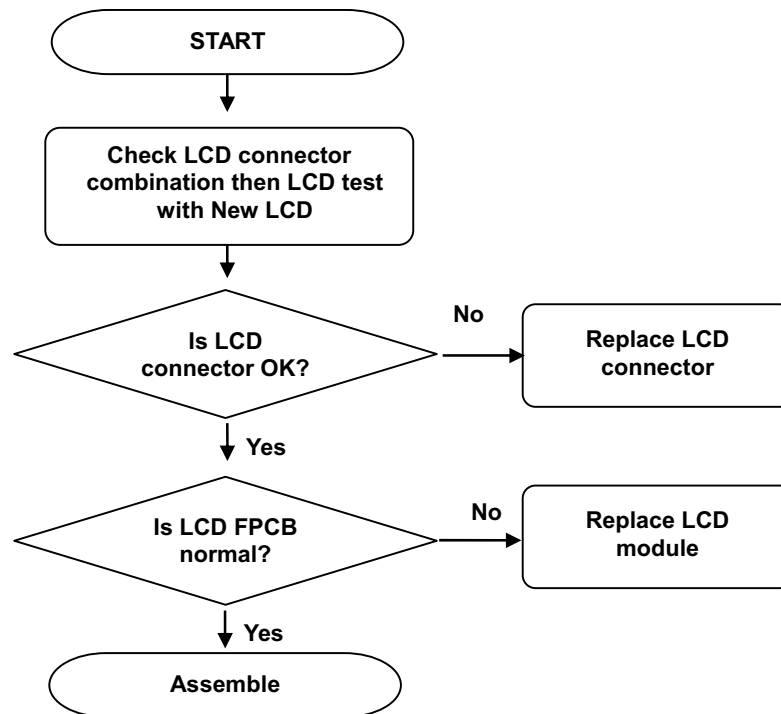
- LCD assembly status ( FPCB)
- Connector combination



70pin FPCB connector

LCD connector



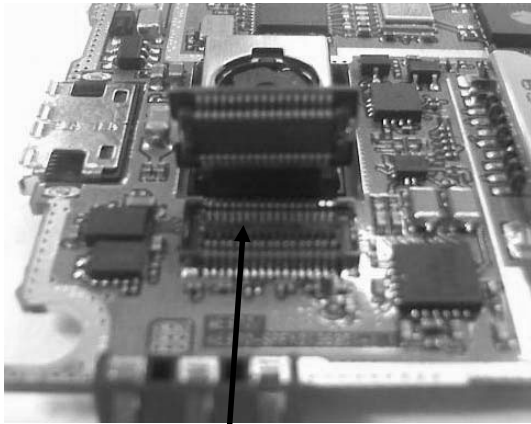
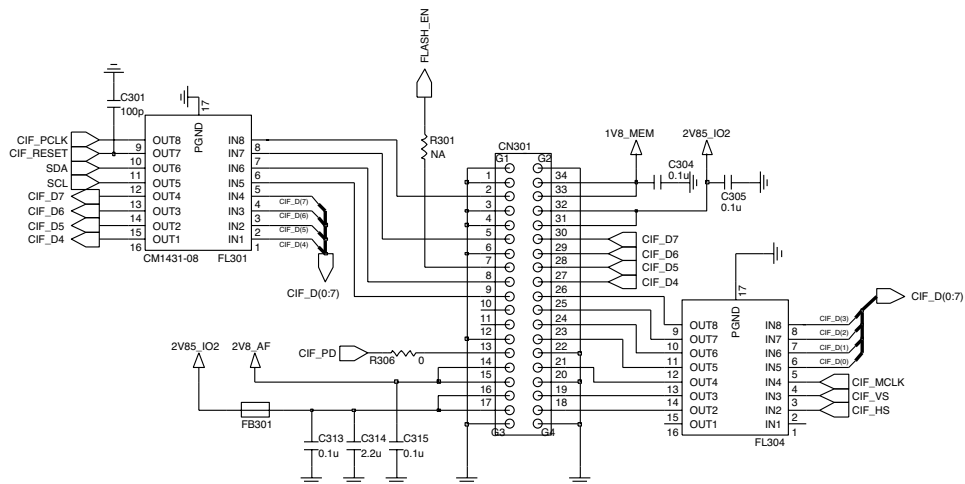


## 5. Trouble shooting

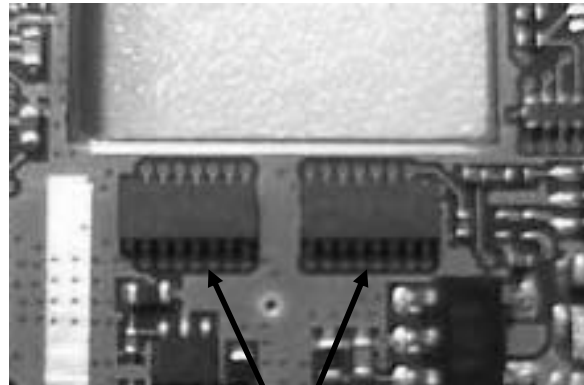
### 5.5 Camera Trouble

#### Check Points

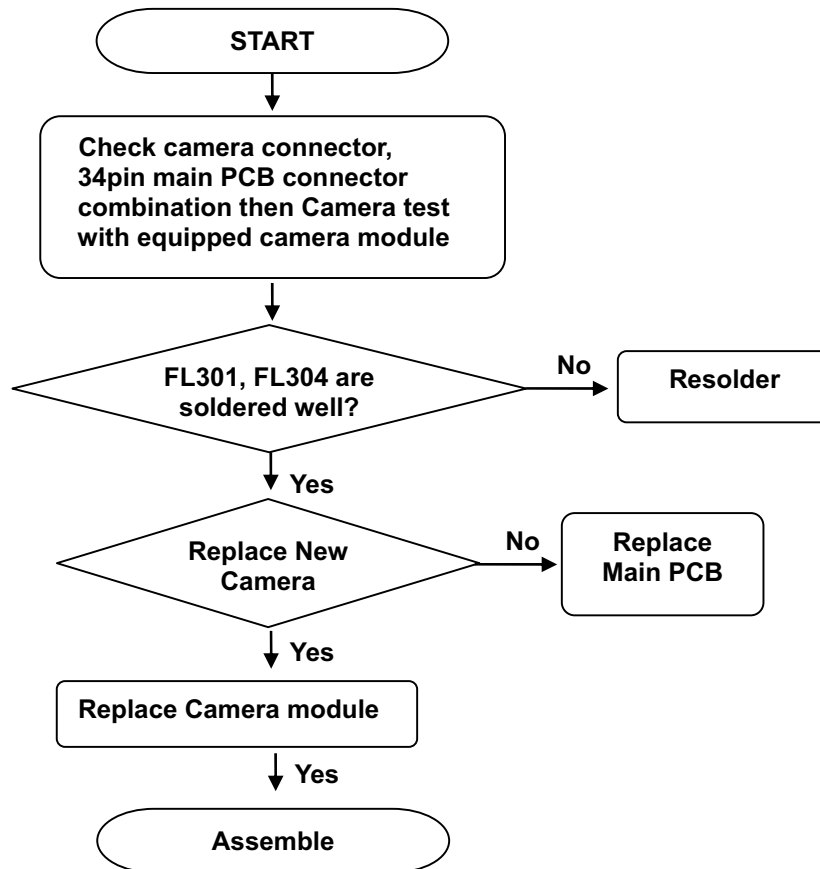
- Connectors combination
- EMI filter soldering



**Check the connector combination**

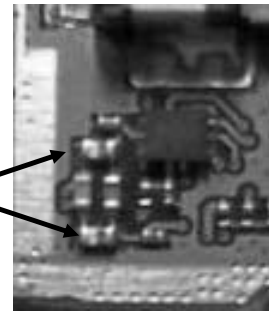
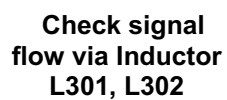
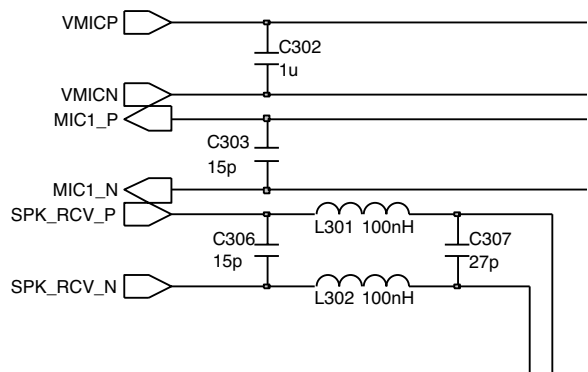


**Check signal flow via EMI filter**

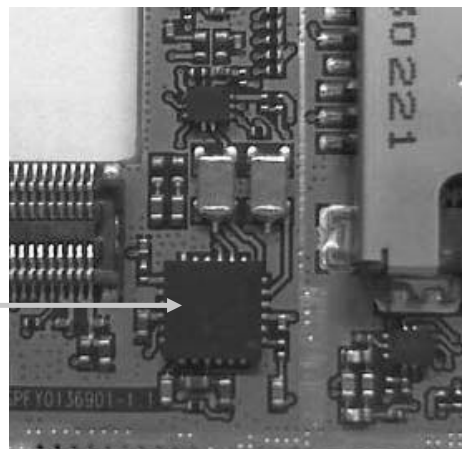




## Check Points

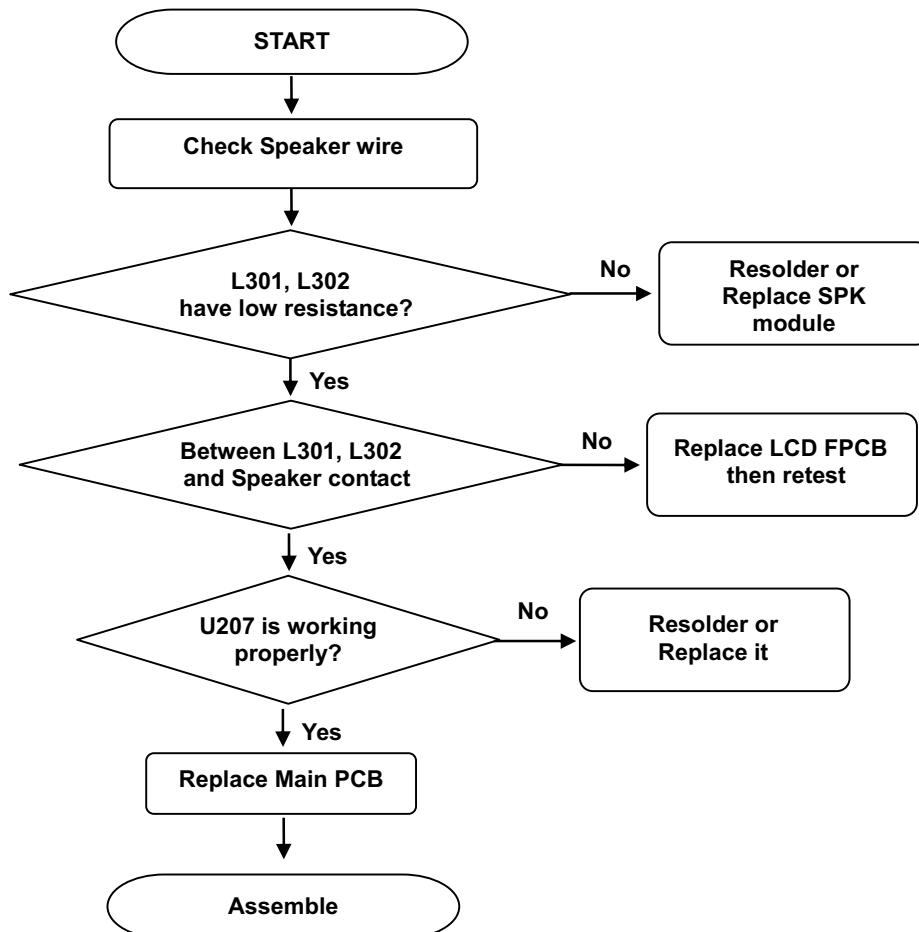


**Check Audio  
amp, In output  
signal**



## 5. Trouble shooting

---

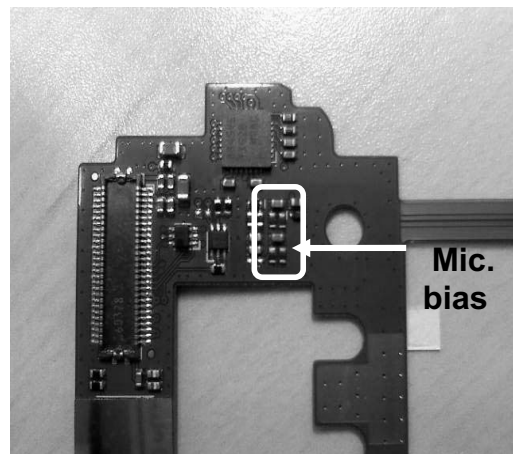
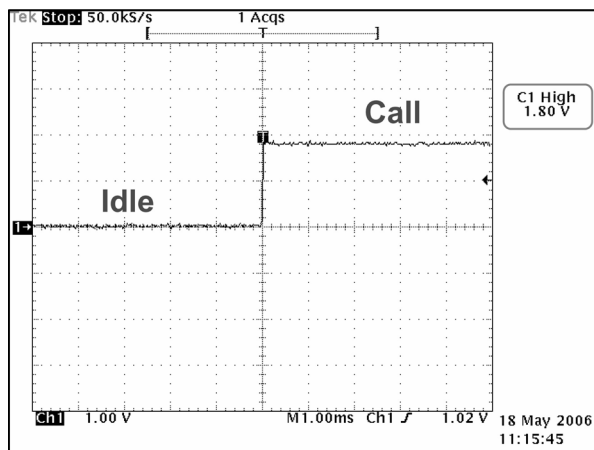
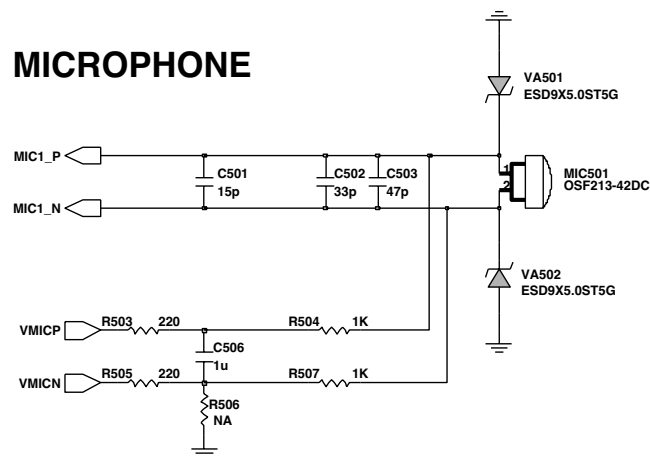


## 5. Trouble shooting

### 5.7 Microphone trouble

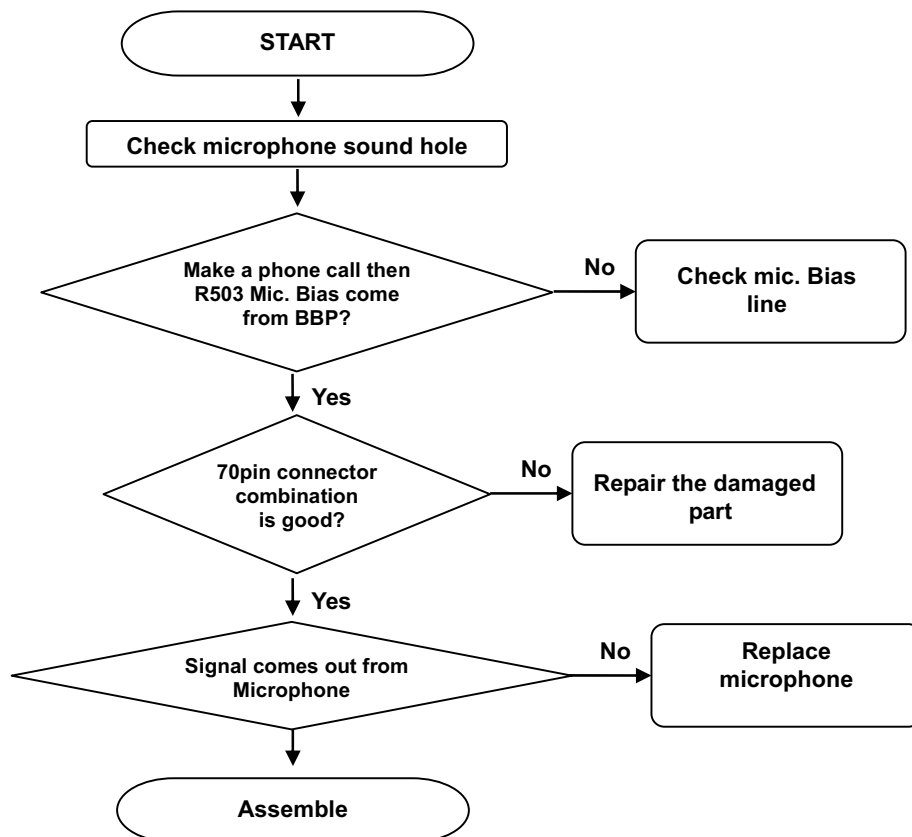
#### Check Points

- Microphone hole
- Mic. Bias & signal come from



## 5. Trouble shooting

---

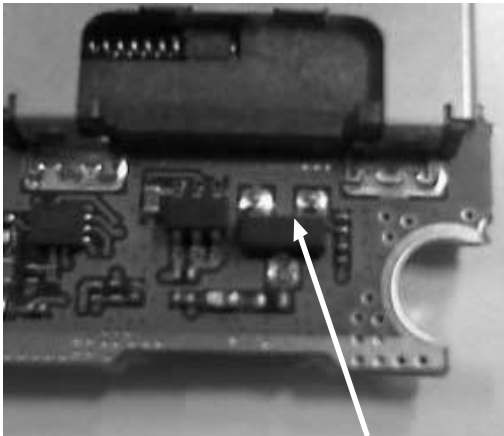
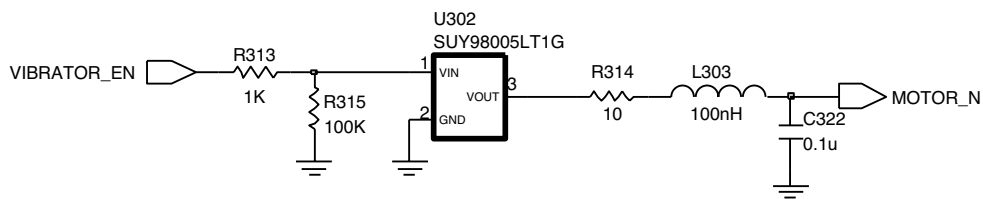


## 5. Trouble shooting

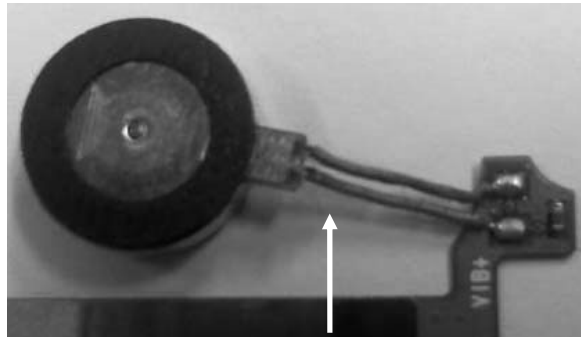
### 5.8 Vibrator trouble

#### Check Points

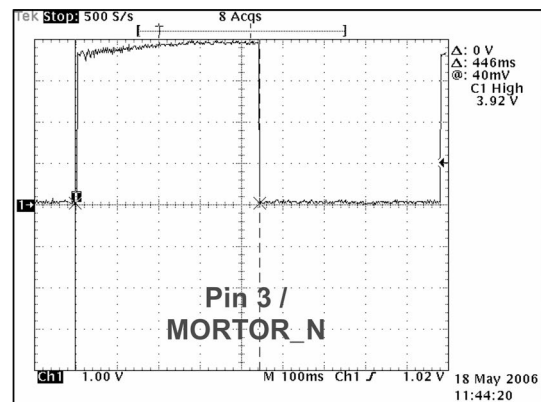
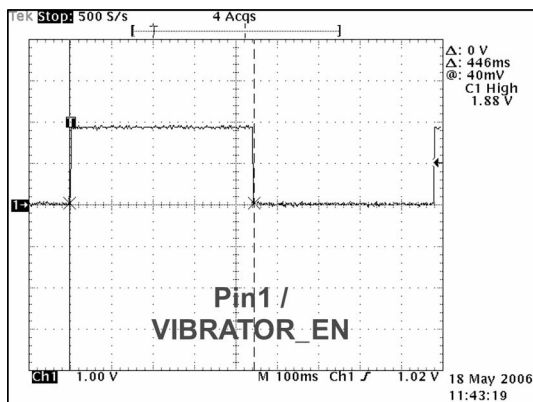
- Vibrator contact
- IC is working correct

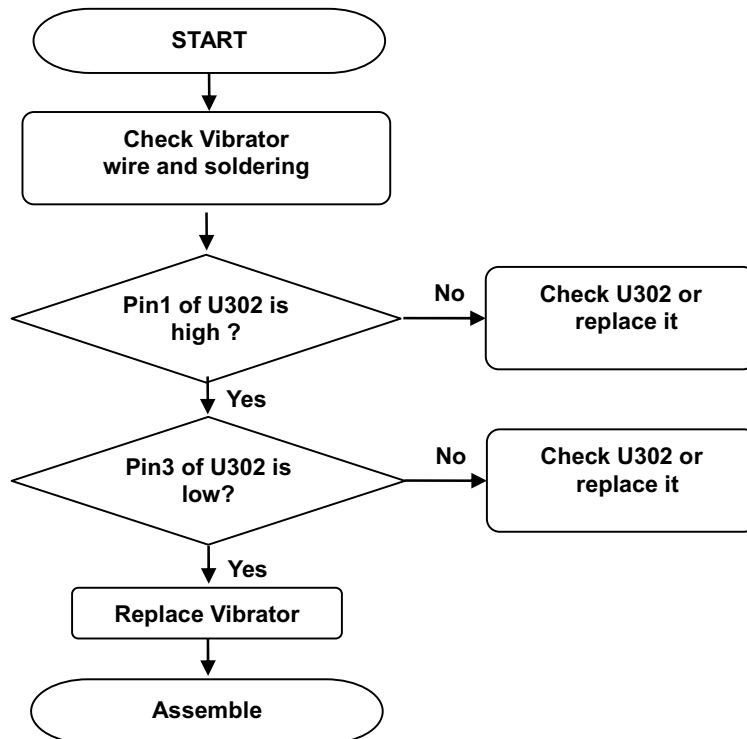


Check the driver IC  
Enable signal goes to  
high then vibration



Check the wire and soldering



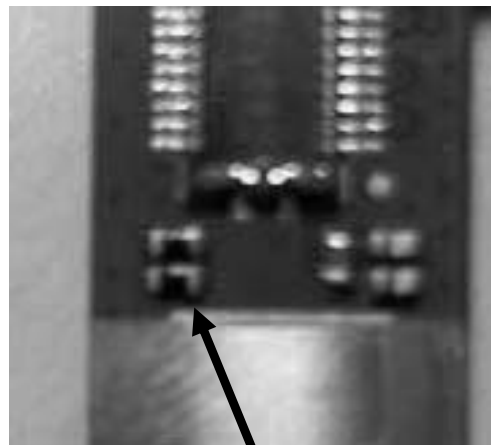
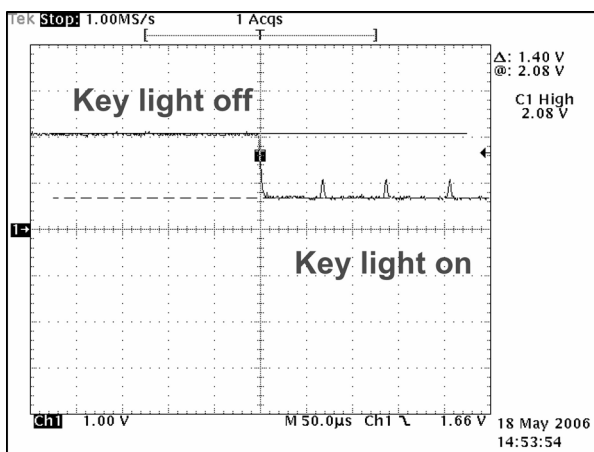
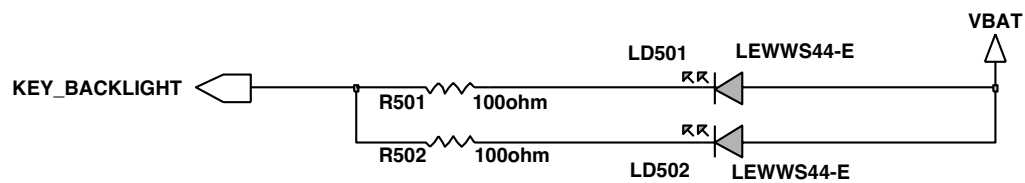


## 5. Trouble shooting

### 5.9 Keypad back light trouble

#### Check Points

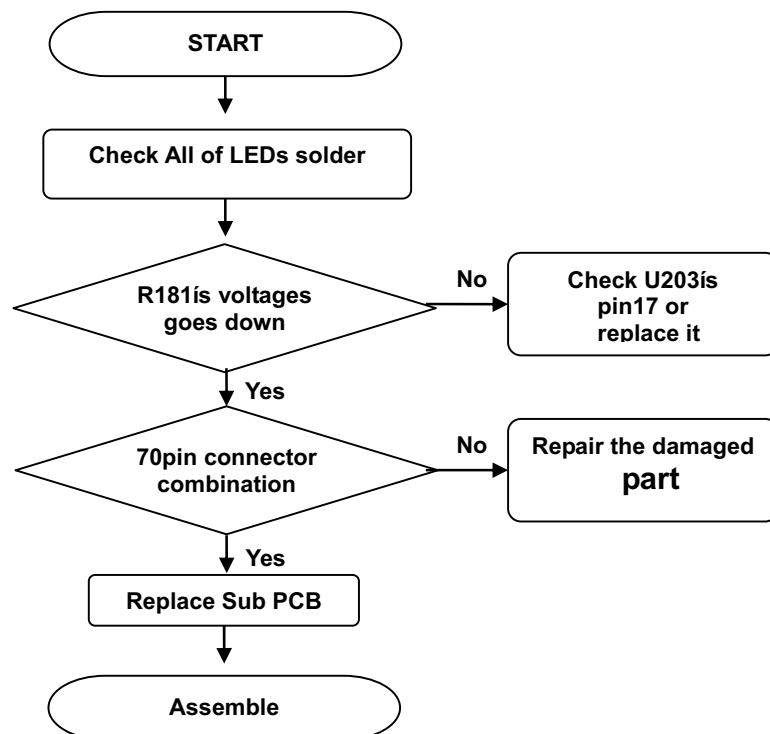
- Signal path is connected well
- Control IC is working properly



**Check R501,502 resistor**

## 5. Trouble shooting

---



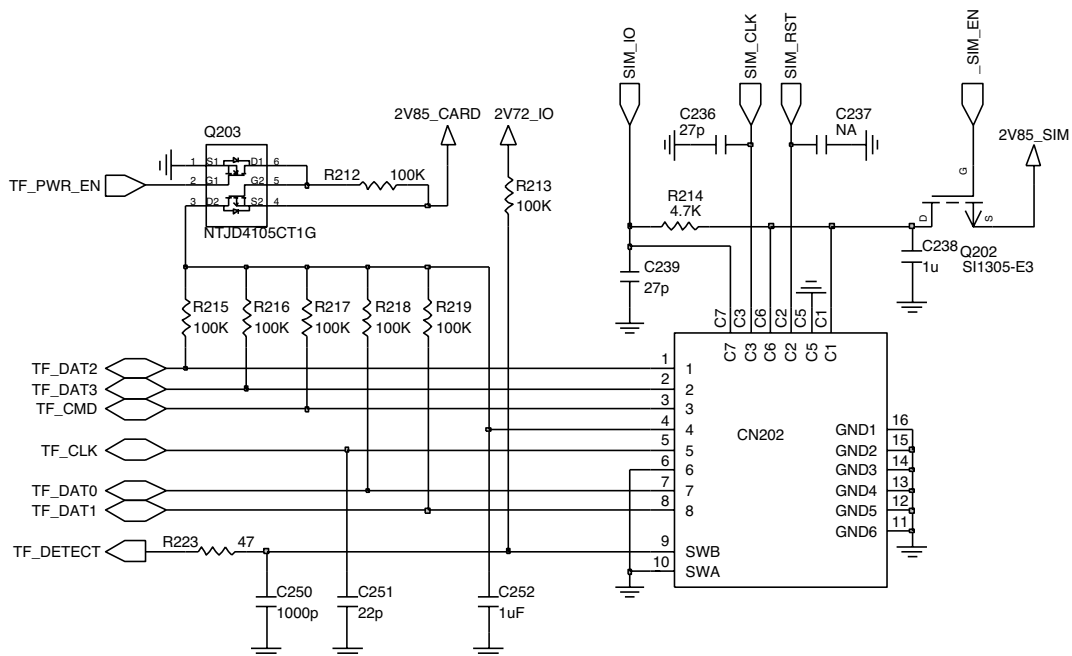


## 5. Trouble shooting

### 5.10 Micro SD and SIM card trouble

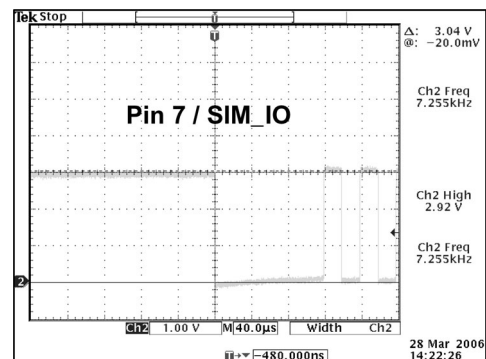
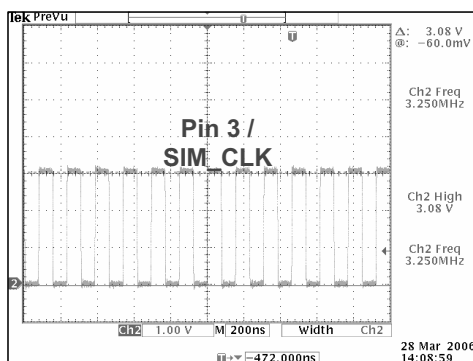
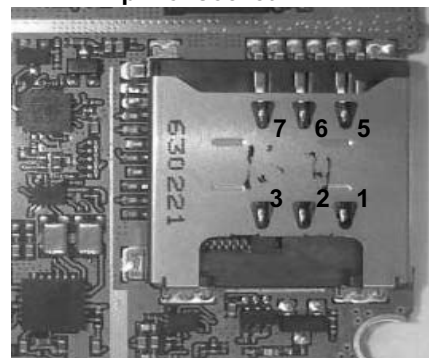
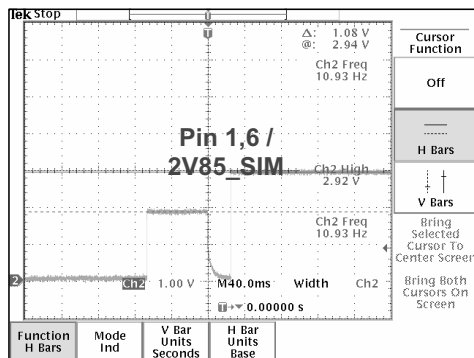
#### Check Points

- Power control FET is working
- Socket soldering
- Proper SIM is used
- Card detect is working

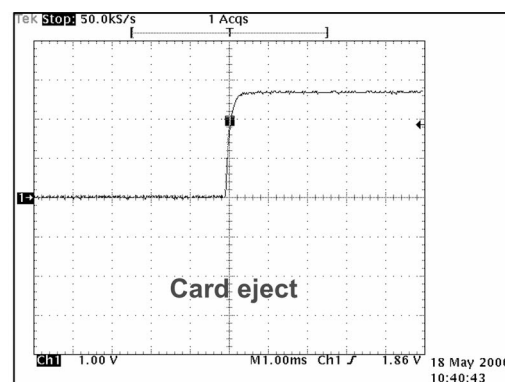
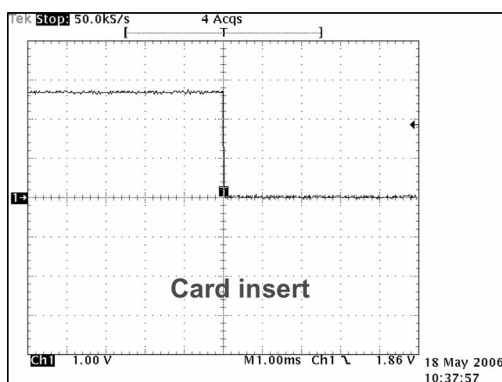
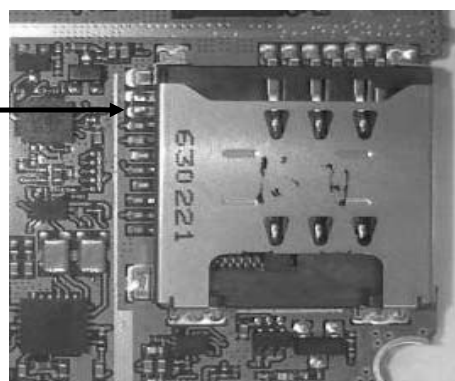


## 5. Trouble shooting

Check  
soldering all  
pin of socket

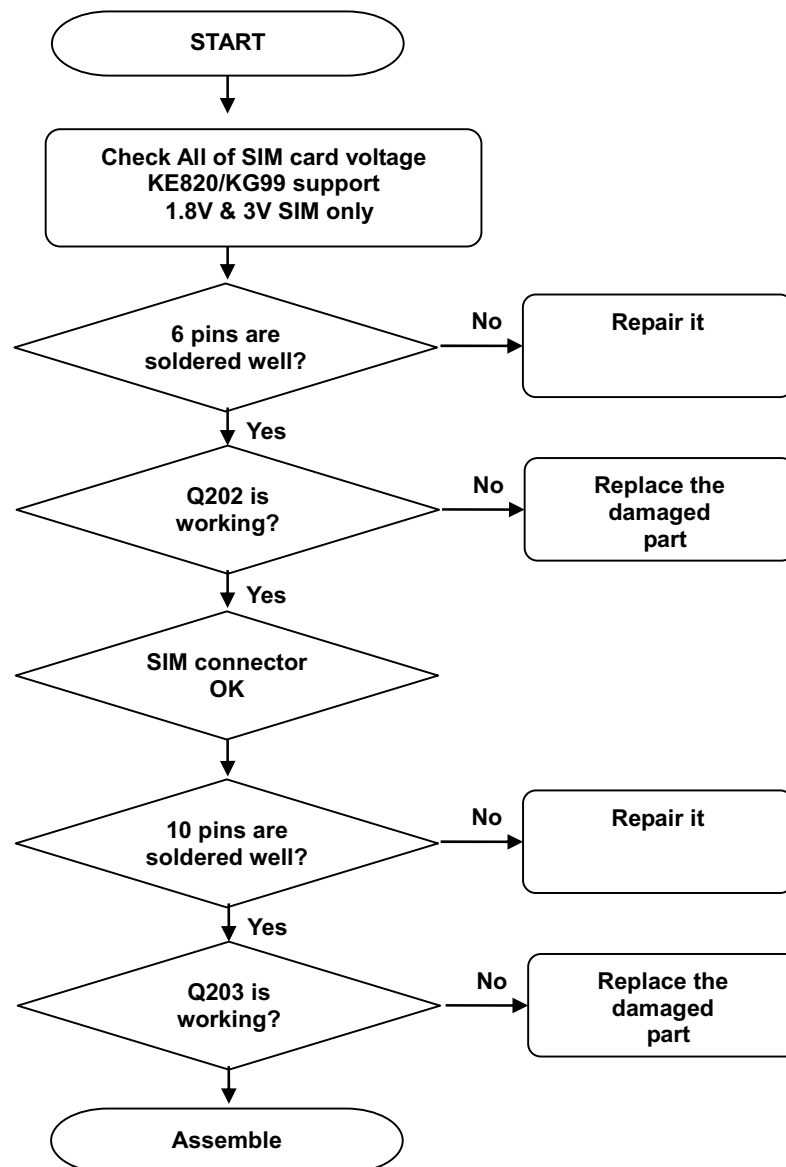


TF\_DETECT



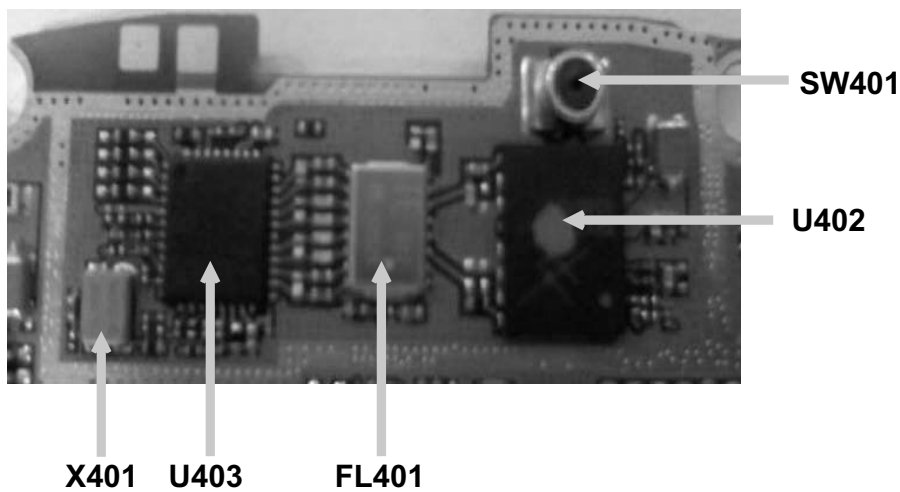
## 5. Trouble shooting

---



5.11 RF PART TROUBLESHOOTING

5.11.1 RF Components

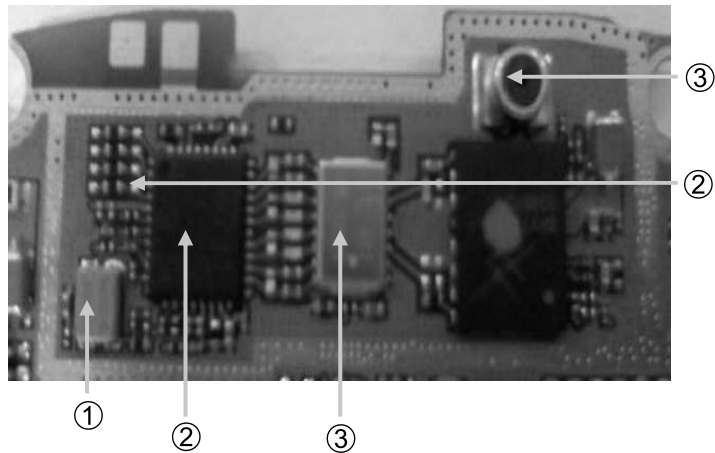
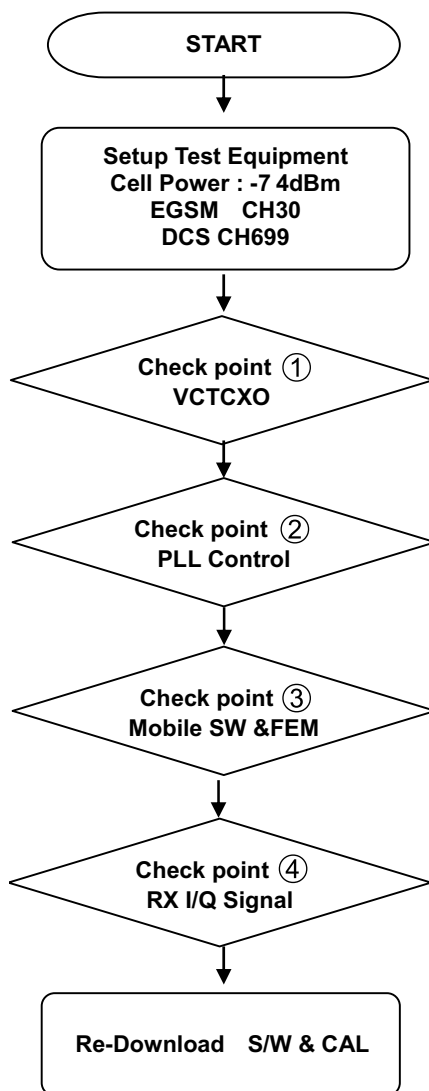


REFERENCE	PART Description
U402	PAM (Power Amplifier Module)
X401	VCTCXO (26MHz)
FL401	FEM (Front End Module)
U403	Transceiver
SW401	Mobile Switch

## 5. Trouble shooting

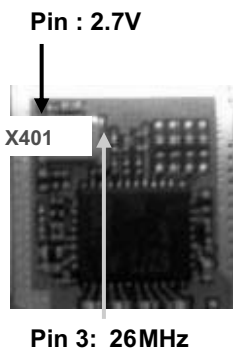
### 5.11.2 Trouble Shooting of Receiver Part

#### Checking Flow

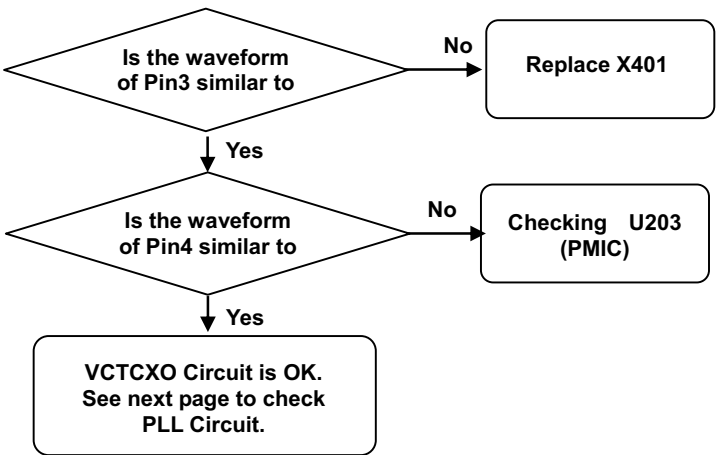


5.11.3 Checking VCTCXO Circuit

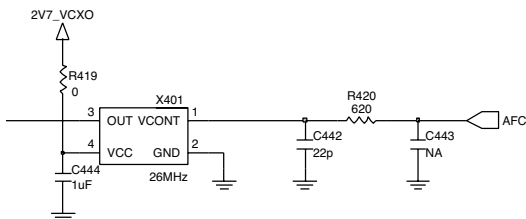
Checking Points



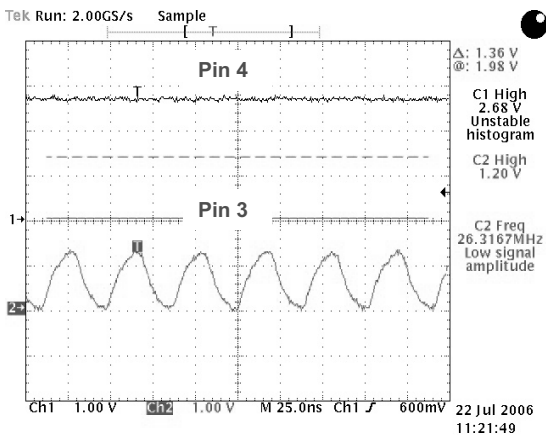
Checking Flow



VCTCXO Circuit Diagram



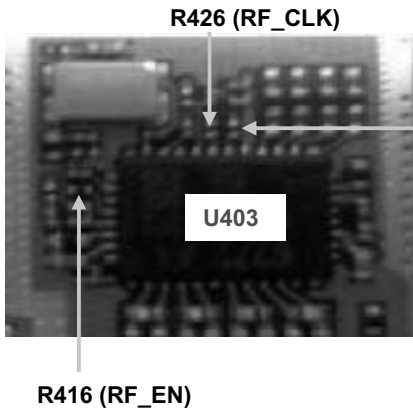
Waveform



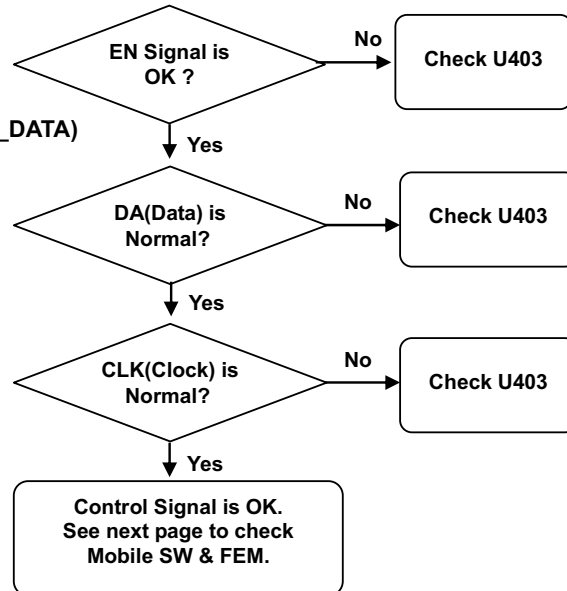
## 5. Trouble shooting

### 5.11.4 Checking PLL Control signals

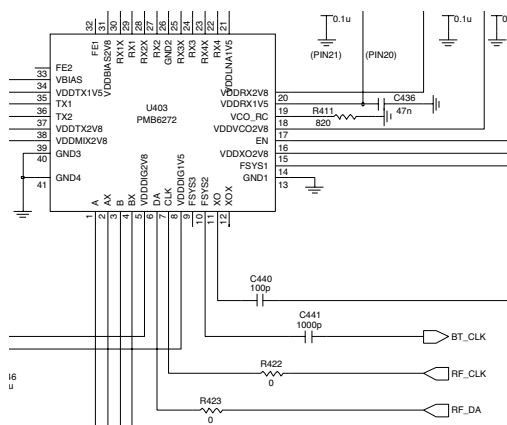
#### Checking Points



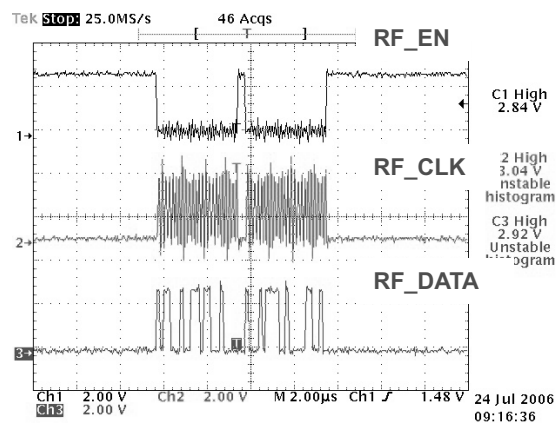
#### Checking Flow



#### RF Transceiver Circuit Diagram

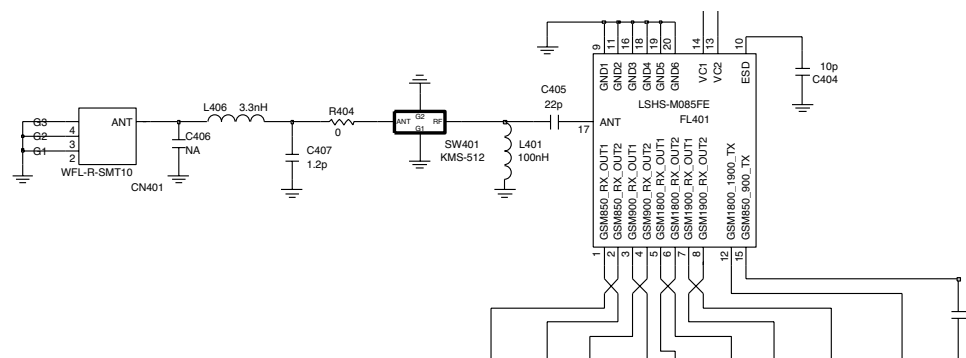


#### Waveform

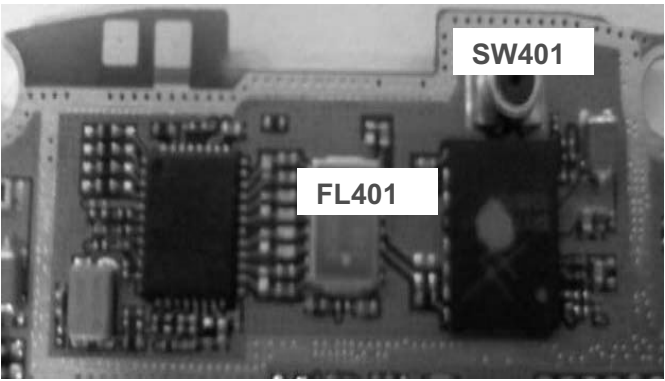


5.11.5 Checking Mobile SW & FEM

Mobile SW & FEM Circuit Diagram



Checking Points

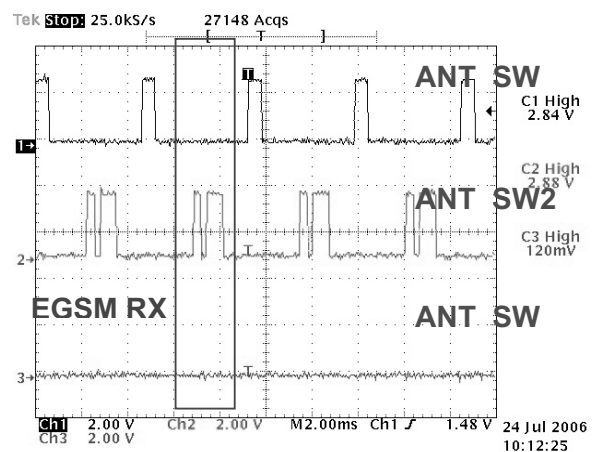
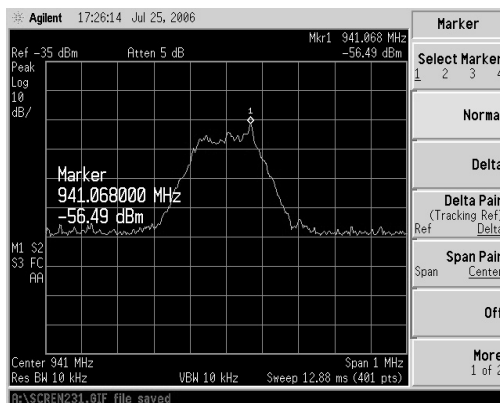
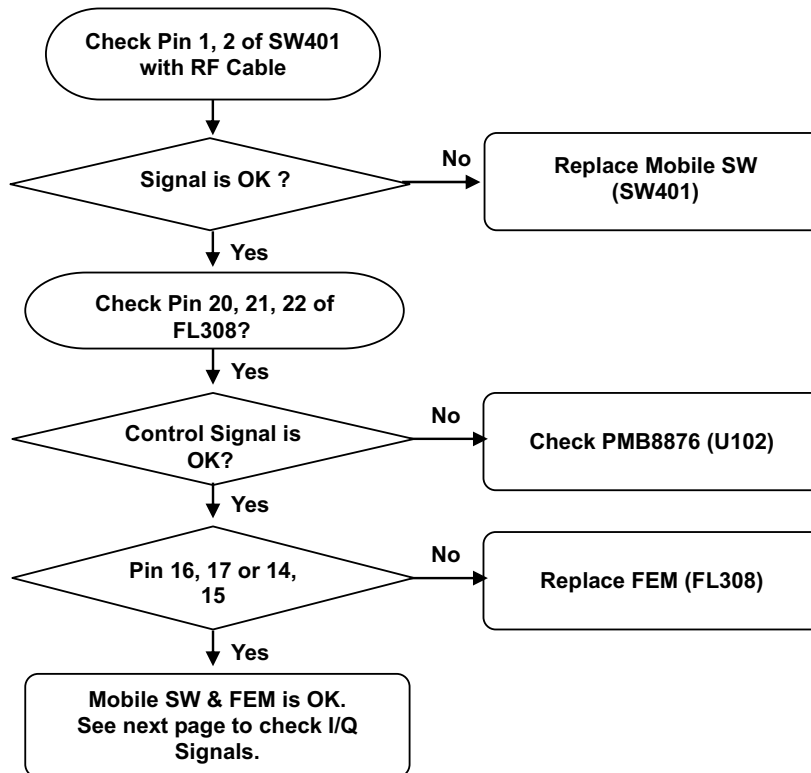


RX Mode	EGSM	DCS	PCS
ANT_SW1	Off	Off	Off
ANT_SW2	On	Off	Off

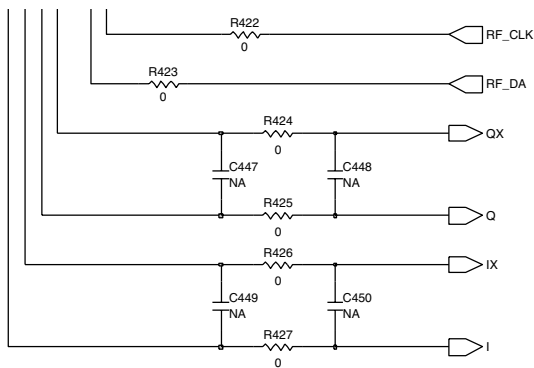


## 5. Trouble shooting

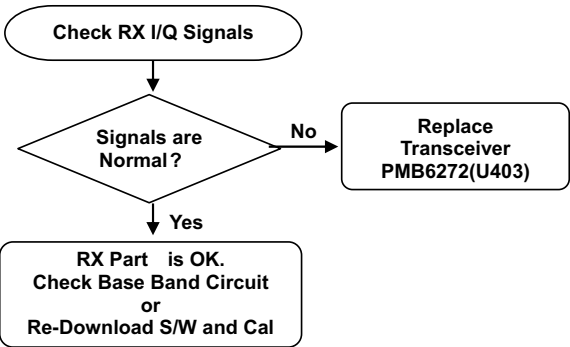
### Checking Flow



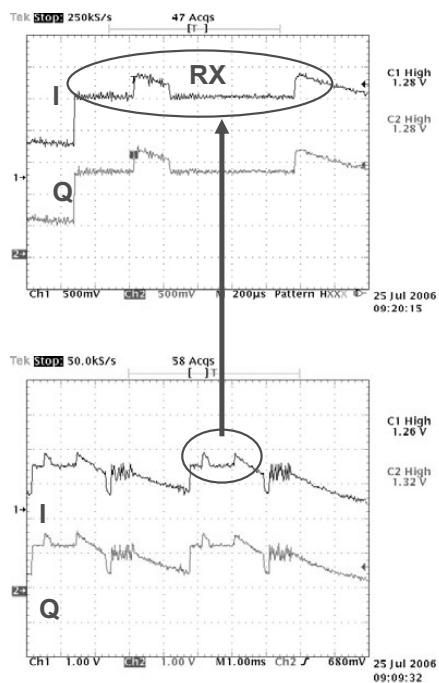
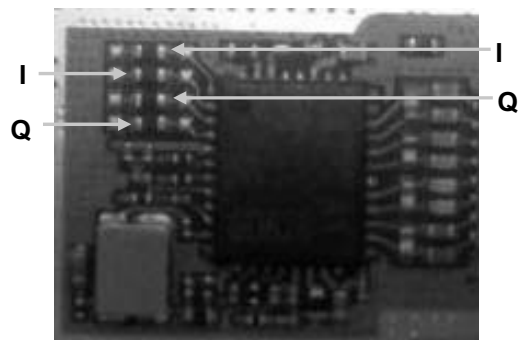
5.11.6 Checking RX I/Q Signals



Checking Flow

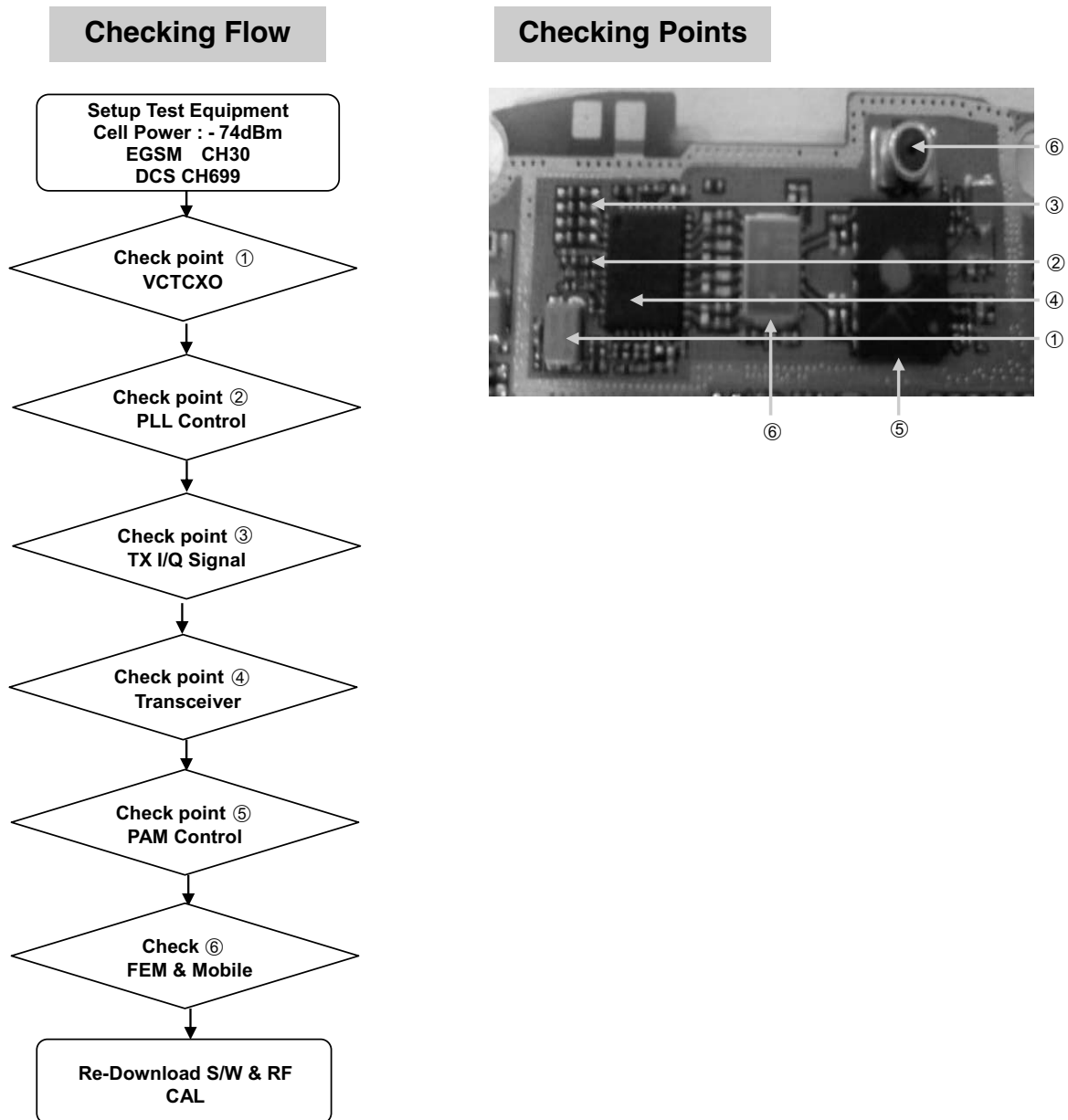


Checking Points



## 5. Trouble shooting

### 5.11.7 Shooting of Transmitter Part



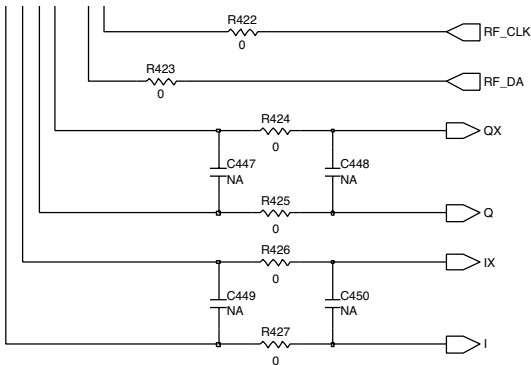
#### 5.11.8 VCTCXO Circuit

See RX Part “1. Checking VCTCXO Circuit”

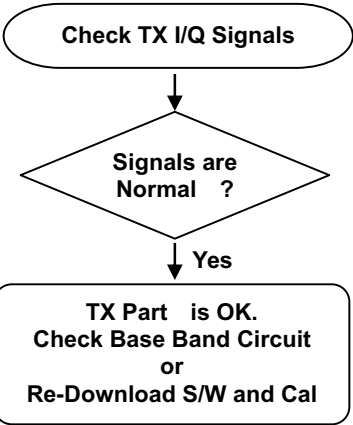
#### 5.11.9 Checking PLL Control Signal

See RX Part “2. Checking PLL Control Signal”

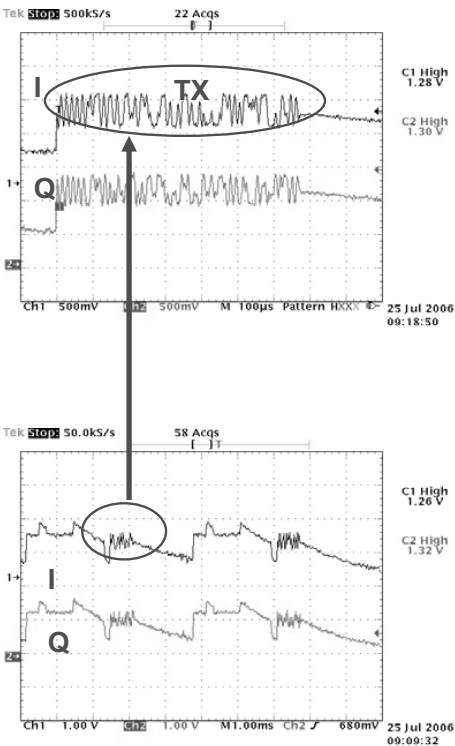
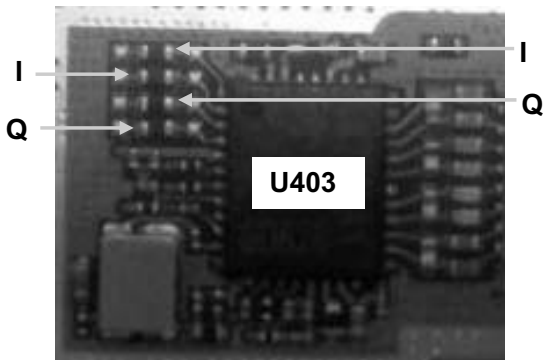
5.11.10 Checking TX I/Q Signals



Checking Flow

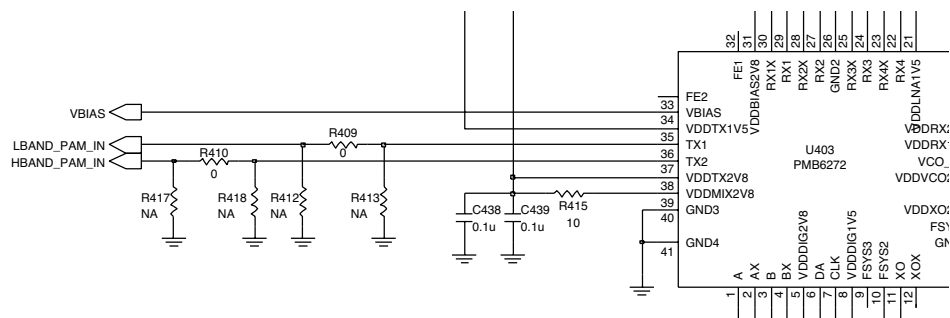


Checking Points

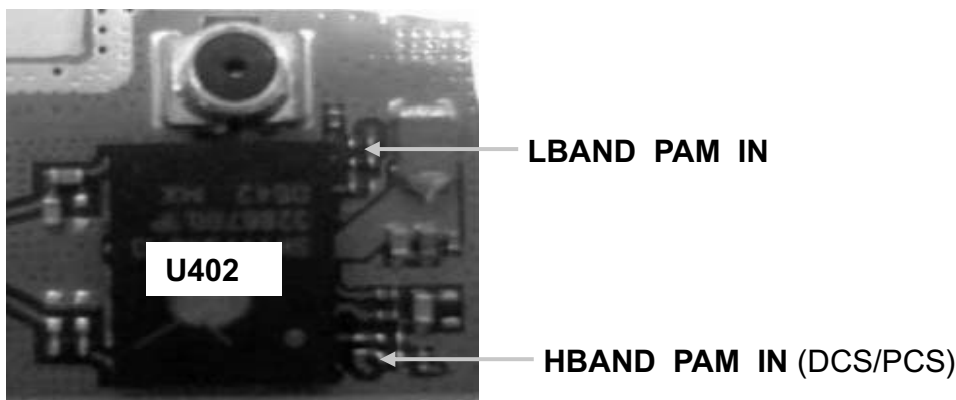


# 5. Trouble shooting

## 5.11.11 Checking Transceiver Output Signals

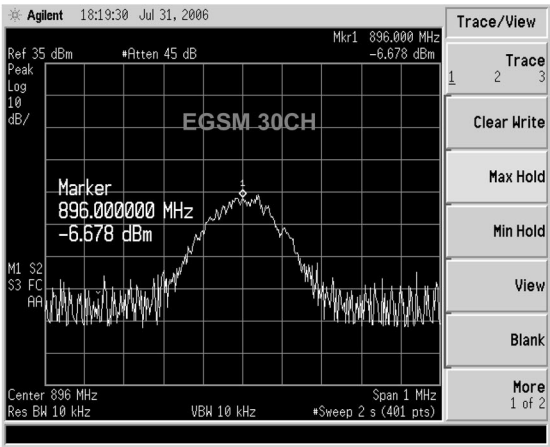
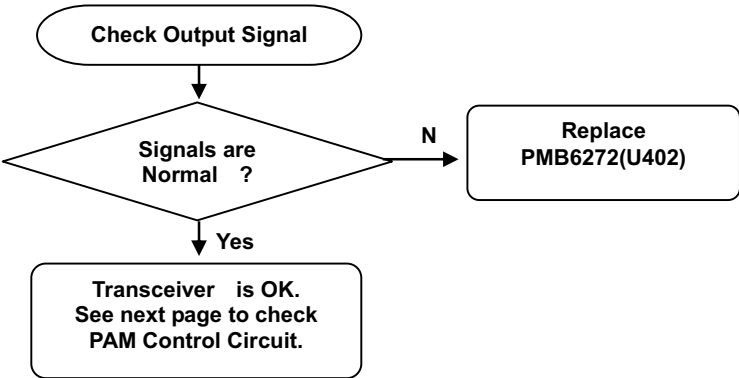


### Checking Points



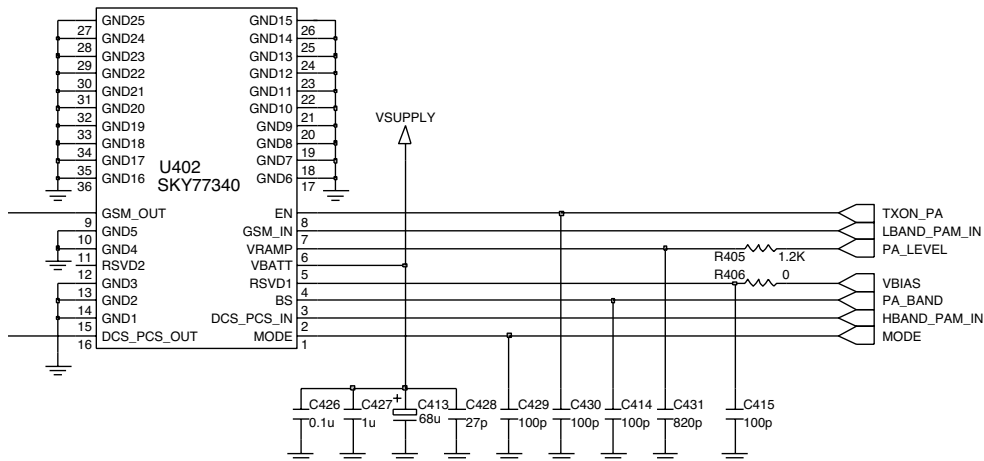
MODE	Transceiver Output
GMSK	Fixed
8PSK	Ramp Burst Control

Checking Flow

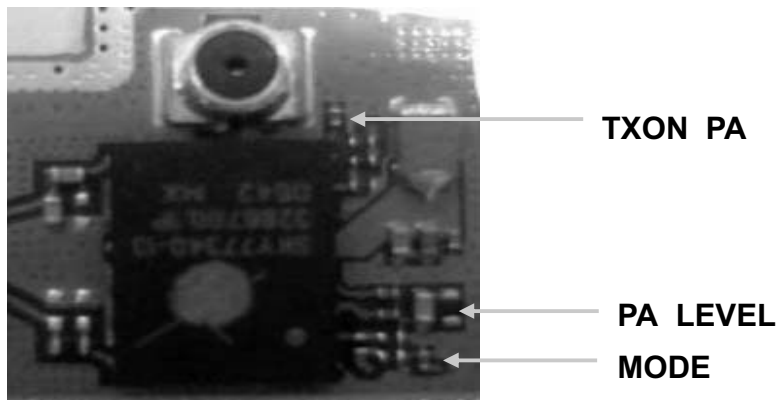


# 5. Trouble shooting

## 5.11.12 Checking PAM Control Signals

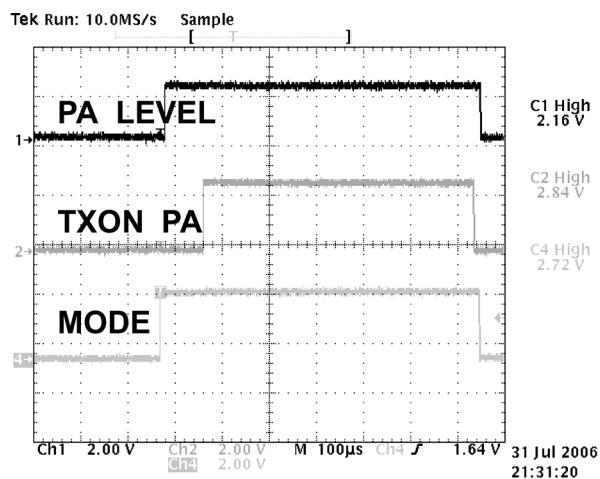
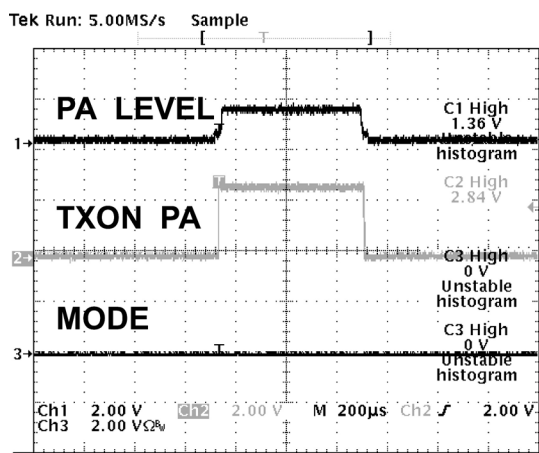
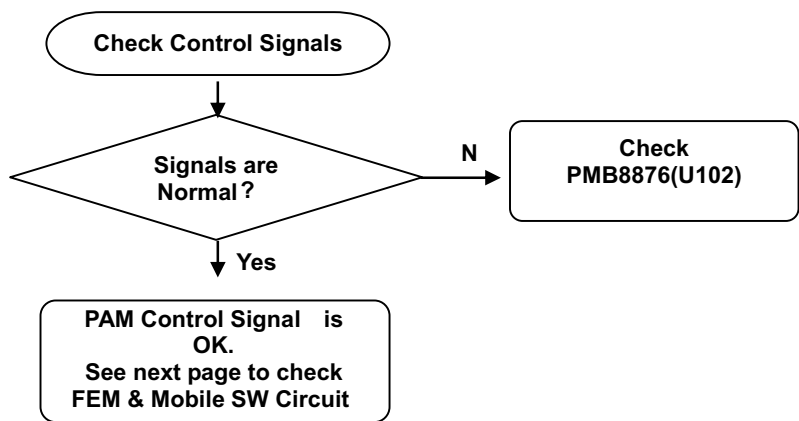


### Checking Points



MODE	MODE	PA_LEVEL	TXON_PA
GMSK	LOW	Ramp Burst Control	HIGH
8PSK	HIGH	Control Amp bias	HIGH

Checking Flow

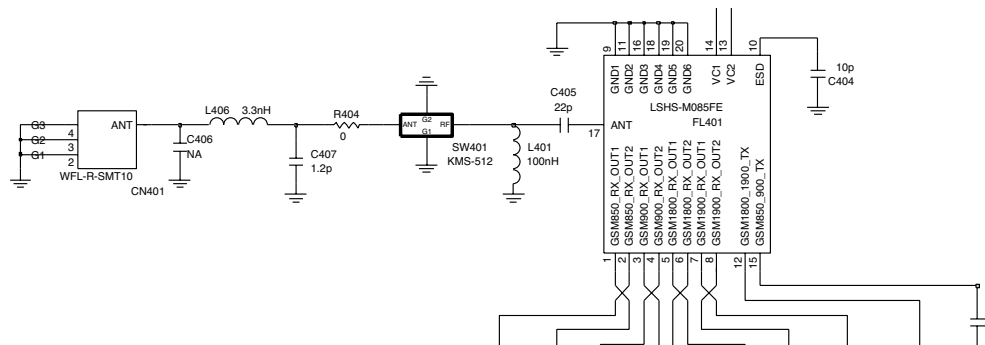




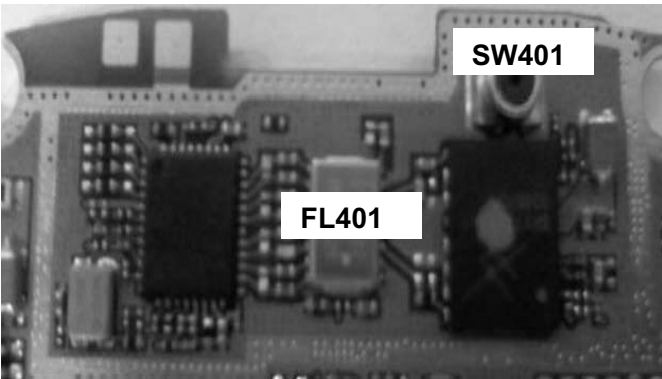
## 5. Trouble shooting

### 5.11.13 Checking FEM & Mobile SW

#### Mobile SW & FEM Circuit Diagram



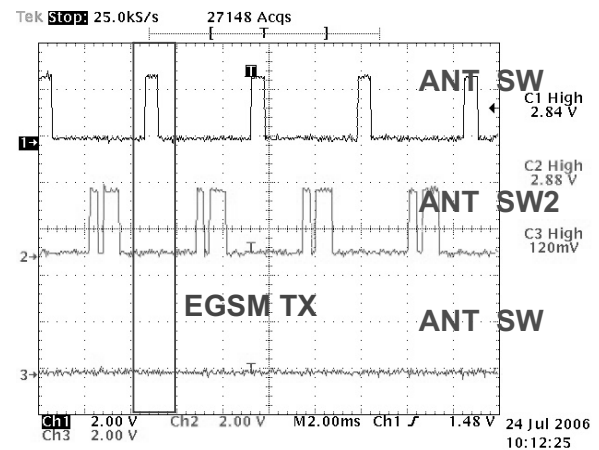
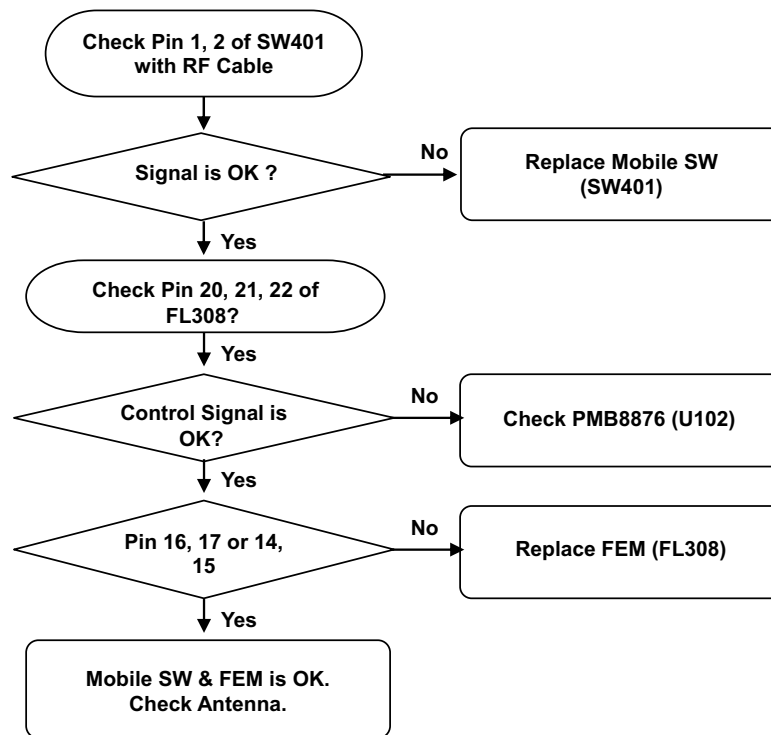
#### Checking Points



TX Mode	EGSM	DCS	PCS
ANT_SW1	On	Off	Off
ANT_SW2	Off	On	On

## 5. Trouble shooting

### Checking Flow

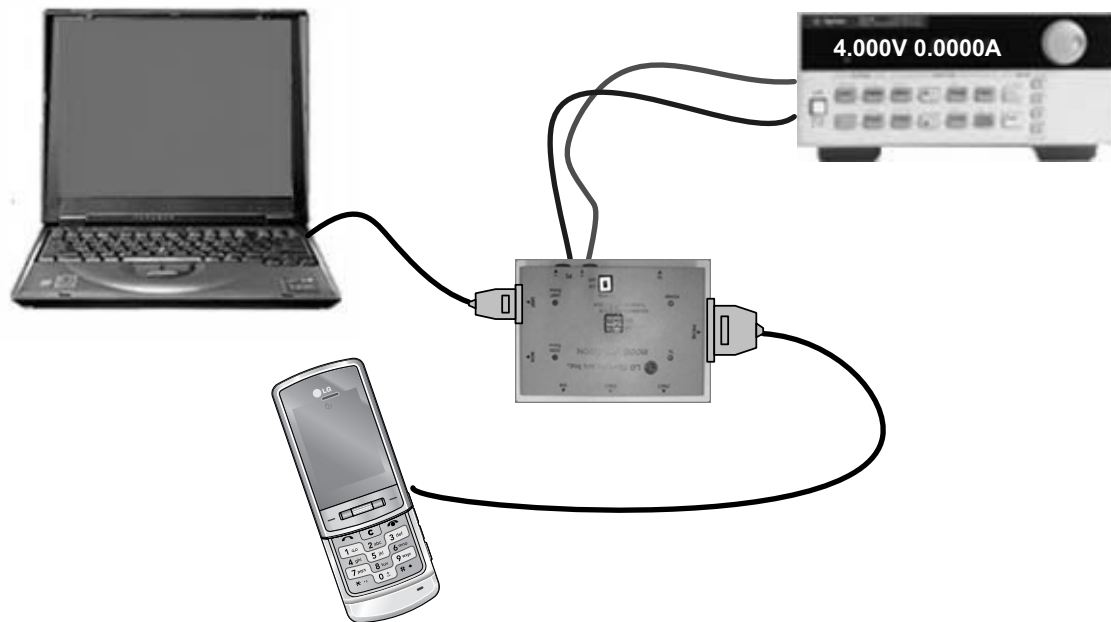


## 6. Download & S/W upgrade

---

## 6. Download & S/W upgrade

### 6.1 S/W download setup



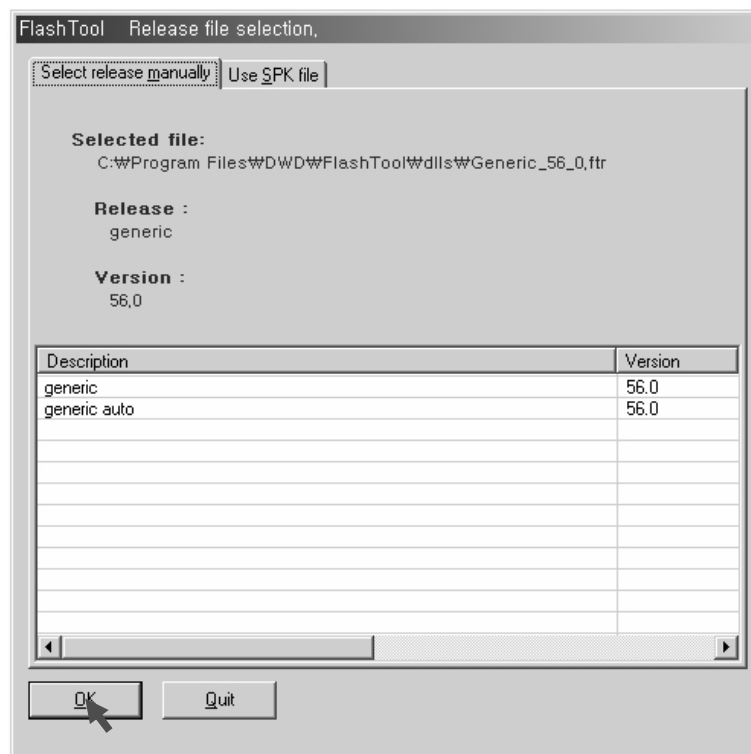
#### Preparation

- Target terminal
- PIF-Union
- RS-232 Cable and PIF-UNION to Phone interface Cable
- Power Supply or Battery
- IBM compatible PC supporting RS-232 with Windows 98 or newer.

If you are going to use battery, the voltage of the battery should be over 3.7V for stable power supplying during S/W download.

### 6.2 Download program user guide

Execute Flashtool program, then below window will be appeared.  
Click the OK button



## 6. Download & S/W upgrade

When the application is started first time the following screen appears.  
Each section is described in the text below.

Click the check box to enable or disable file download.  
Click on the blue text to select the file to download.  
This will open a normal file select box. Select the wanted file.

**Download/update setup**

☒ **Download software file**  
**Phone software file (FLS):**  
D:\Backup1\2\_KE820\Son80\_image\KE820\_V08i\_01\_Hw\_PV4\_05\_0710\MPE.flx  
☒ **Always erase the Dynamic eeprom**  
☐ **Erase the Dynamic eeprom if current and new version is different**

---

☒ **Static eeprom data** ☒ **Download** ☐ **Update** **Project prefix**  
☒ **Manual file select** **None**  
**Static eeprom default data file (EEP):**  
D:\Backup1\2\_KE820\Son80\_image\KE820\_V08i\_01\_Hw\_PV4\_05\_0710\MPE.eep  
☐ **Program phone to start in test mode**  
**WARNING: This will overwrite all calibration data in the phone!**

---

☒ **Flash File System**  
**Static FFS area :** ☒ **Download**  
**Dynamic FFS area :** ☒ **Download**  
kup1\2\_KE820\Son80\_image\KE820\_V08i\_01\_Hw\_PV4\_05\_0710\SON80\_FFS00014.020.difs  
**WARNING: This will overwrite all user settings in the phone!**

---

☐ **Download customization file**  
**Customization file (CUST):**  
View or select CUST files.

---

☐ **Use ATE control**  
**ATE Control file (DLL):**  
None

---

<b>First COM port:</b>	<b>Number of ports:</b>	<b>Baud rate:</b>
COM3	1	921600
<input checked="" type="radio"/> <b>Use COM ports</b>	<input type="radio"/> <b>Use USB ports.</b>	

---

Click on an item to change it. [Change platform](#)

[Save config.](#) [OK](#) [Quit](#)

## 6. Download & S/W upgrade

Click on the blue text to select the COM port.

**Download/update setup**

☒ **Download software file**  
**Phone software file (FLS):**  
D:\Backup1\2\_KE820\Son80\_image\KE820\_V08\_L01\_Hw\_PV4\_05\_0710\MPE.flx  
☒ **Always erase the Dynamic eeprom**  
☐ **Erase the Dynamic eeprom if current and new version is different**

---

☒ **Static eeprom data**      ☒ **Download**      ☐ **Update**      **Project prefix**  
Static eeprom default data file (EEP):      ☒ **Manual file select**      None  
D:\Backup1\2\_KE820\Son80\_image\KE820\_V08\_L01\_Hw\_PV4\_05\_0710\MPE.eep  
☐ **Program phone to start in test mode**  
**WARNING: This will overwrite all calibration data in the phone!**

---

☒ **Flash File System**  
**Static FFS area :**      ☒ **Download**  
**Dynamic FFS area :**      ☒ **Download**  
D:\Backup1\2\_KE820\Son80\_image\KE820\_V08\_L01\_Hw\_PV4\_05\_0710\SON80\_FFS00014.  
**WARNING: This will overwrite all user settings in the phone!**

---

☐ **Download customization file**  
**Customization file (CUST):**  
View or select CUST files.

---

☐ **Use ATE control**  
**ATE Control file (DLL):**  
None

---

**First COM port:**      **Number of ports:**      **Baud rate:**  
COM3      1      921600  
COM3  
☒ **Use COM ports**      ☐ **Use USB ports.**

---

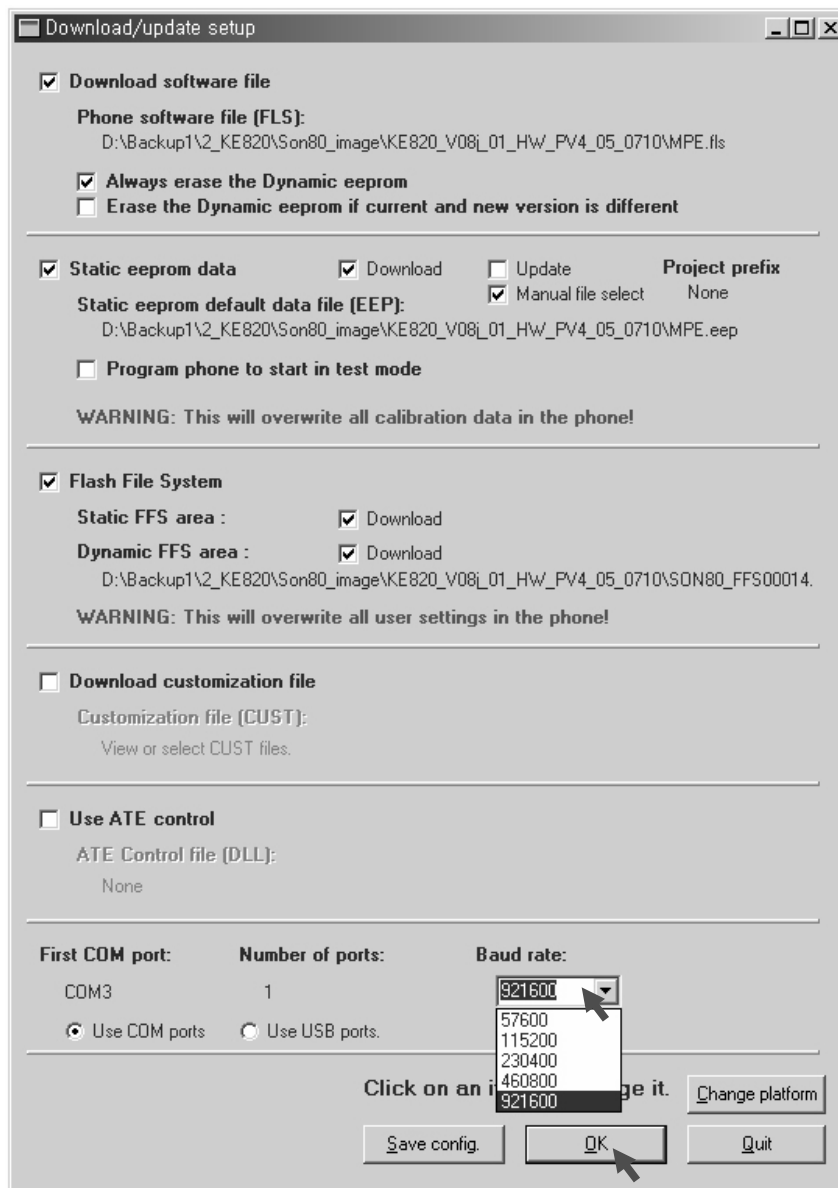
Click on an item to change it.      [Change platform](#)

[Save config.](#)      [OK](#)      [Quit](#)

## 6. Download & S/W upgrade

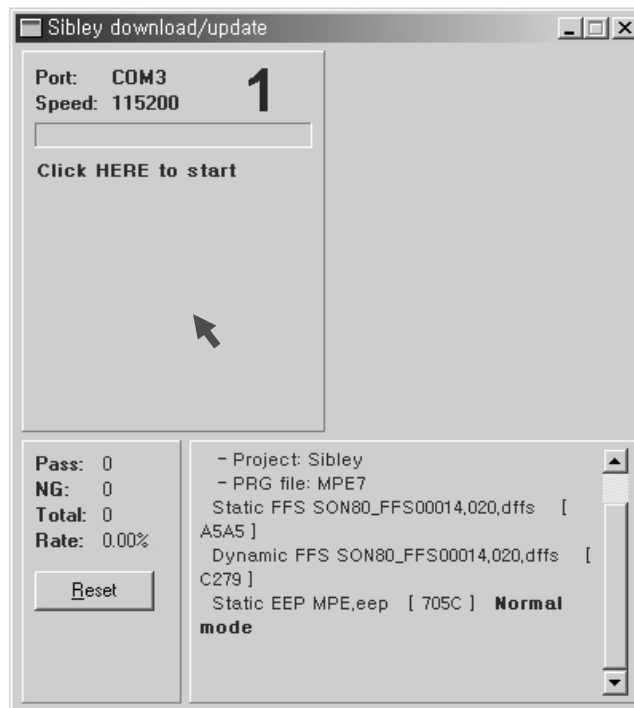
Click on the blue text to select the Baud rate.

Click OK button to next step.



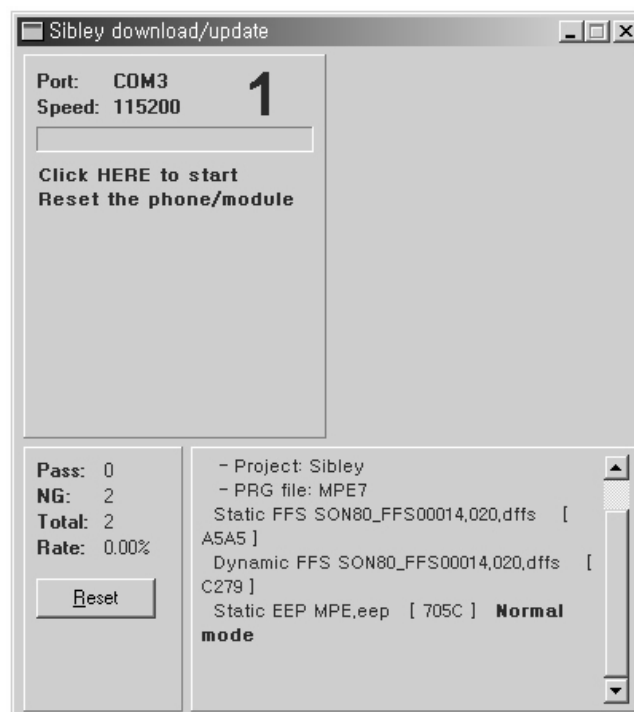
## 6. Download & S/W upgrade

Will change the window as below



Click to anywhere on the control panel to start download.

Can see the "Reset the phone/module" then remote power on the target phone

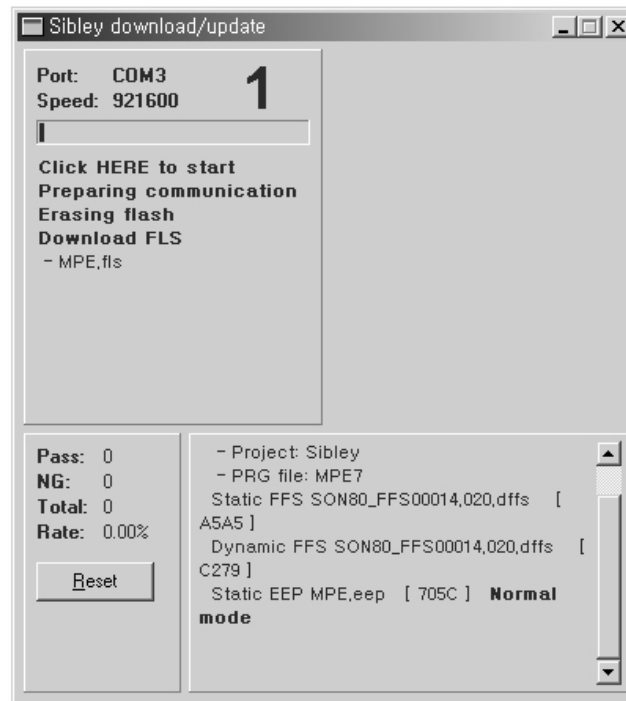




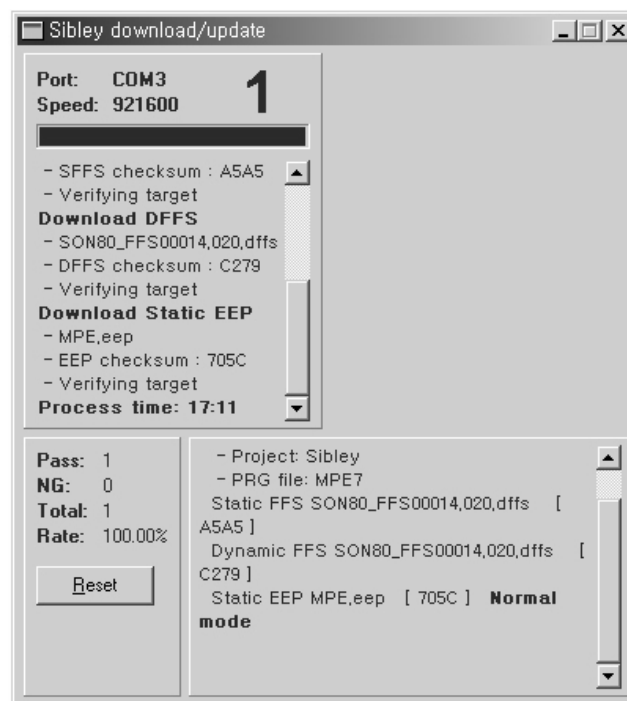
## 6. Download & S/W upgrade

---

During download, the screen will look something like this:



The blue bar shows the download progress. The FLS filename and the expected checksum are shown. The download statistics are shown. Click "Reset" to reset the counters.



After download, the status is shown.

## 6. Download & S/W upgrade

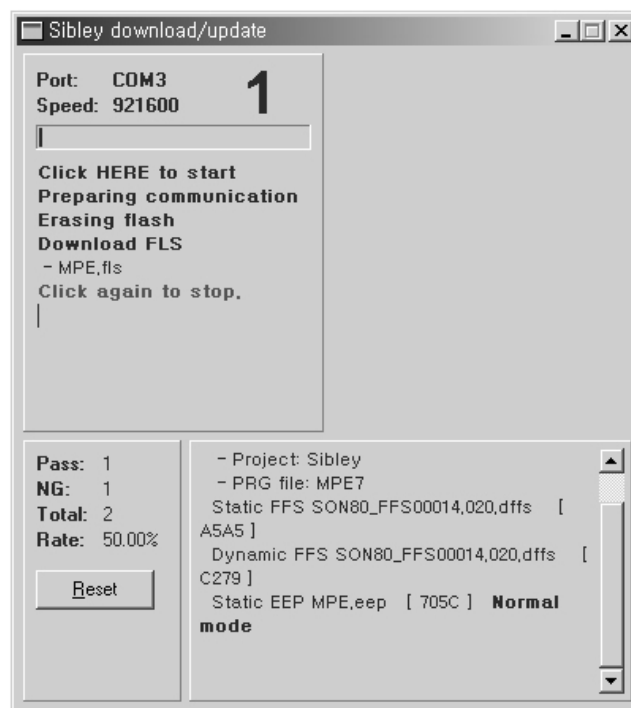
If there is a need to stop the download process, click on the panel for the channel to be stopped.

To stop the download the panel must be clicked twice.

This is to avoid that the download is stopped accidentally.

Furthermore, to avoid that the download is stopped on a mouse double-click, there must be at least 0.5 second between the two clicks.

If the panel is clicked only once, the text "Click again to stop" will disappear and the download will continue.

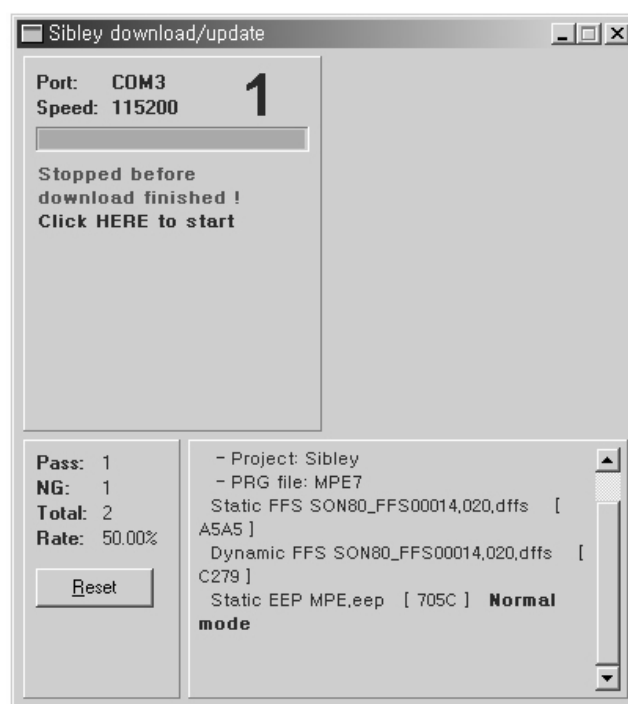


If a valid second click is detected, the download process is stopped and the progress bar turns yellow. At this point the download can be started from the beginning as usually.

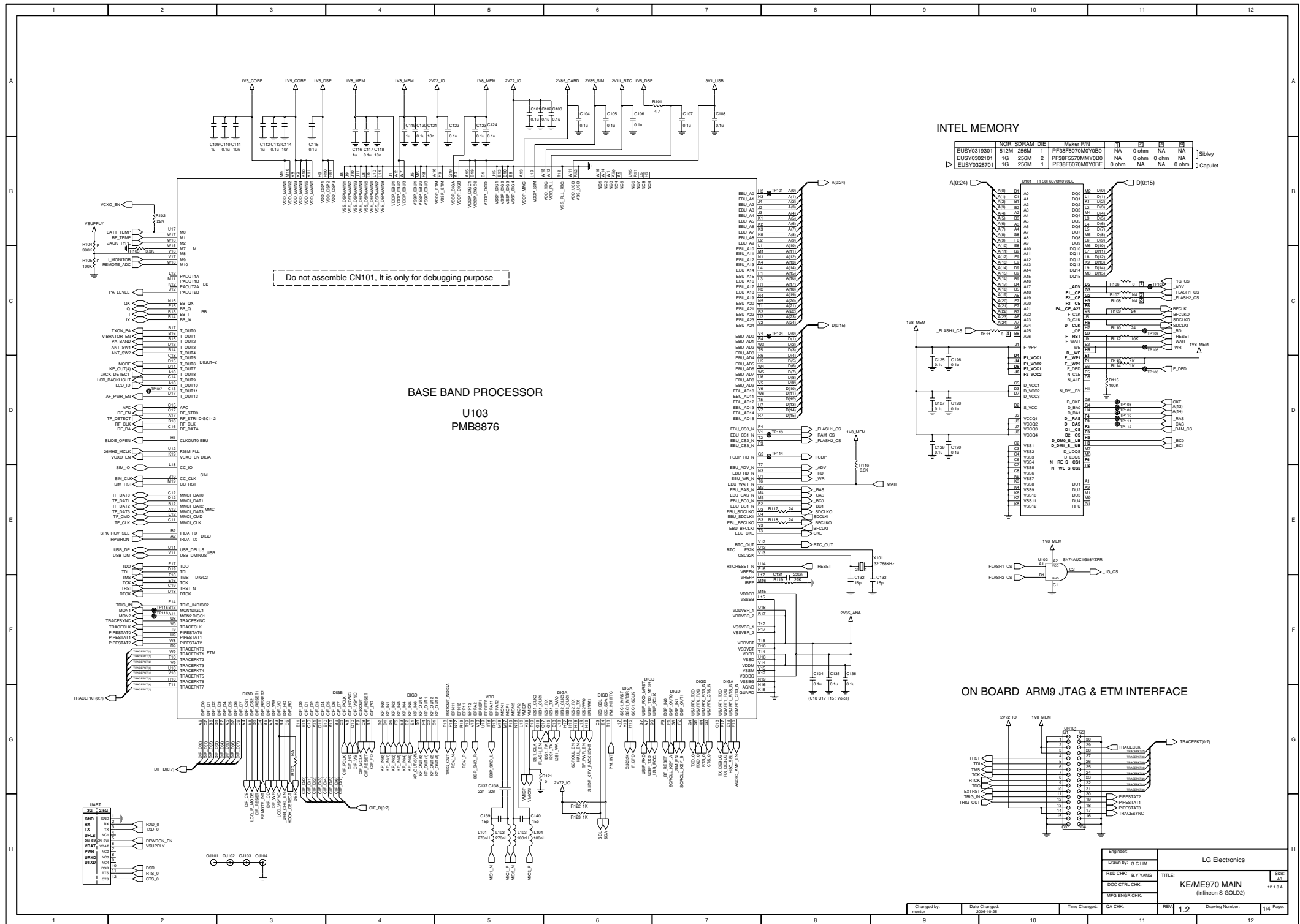
NOTE: That the download statistic is unaffected when the download is stopped manually.

## 6. Download & S/W upgrade

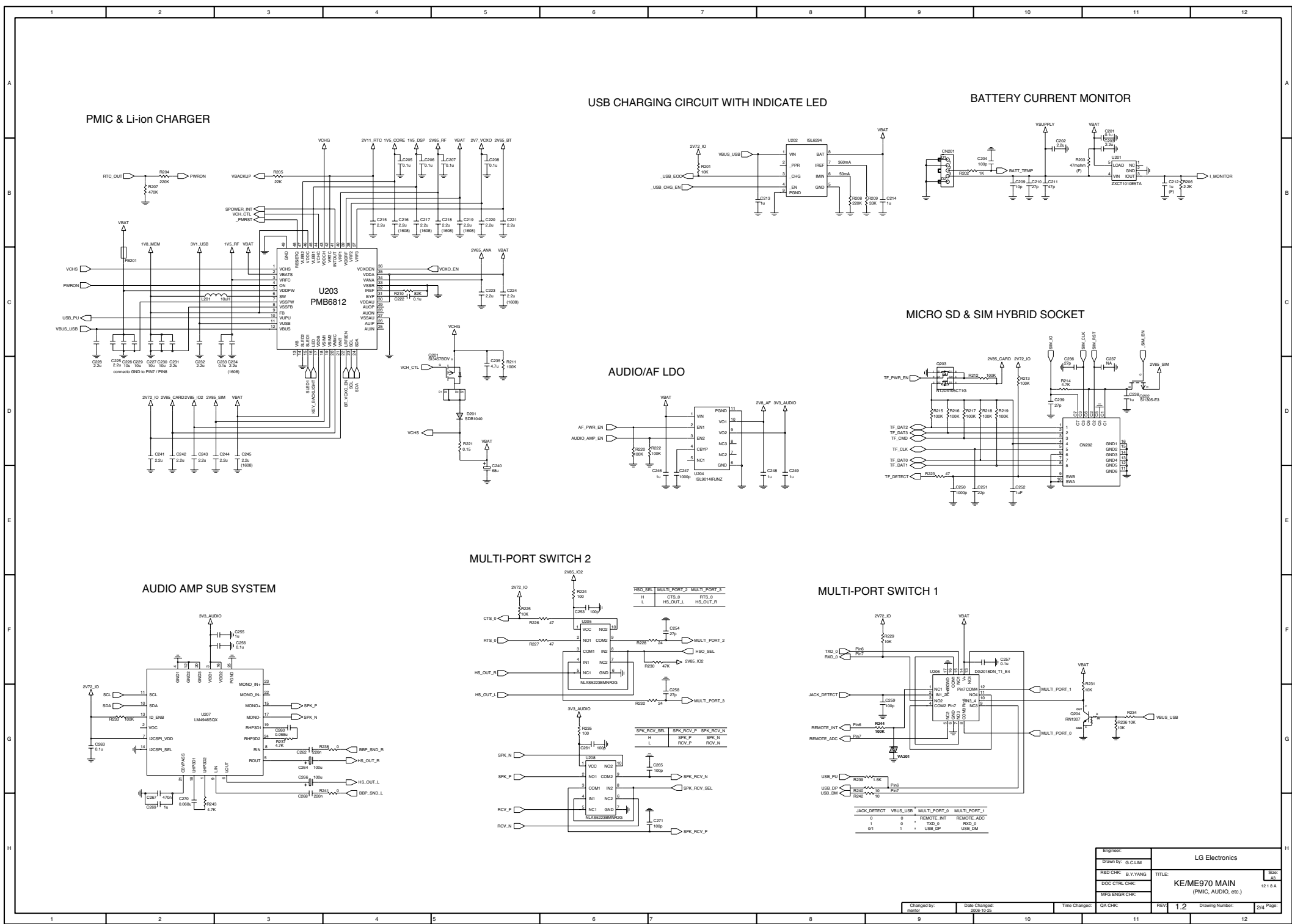
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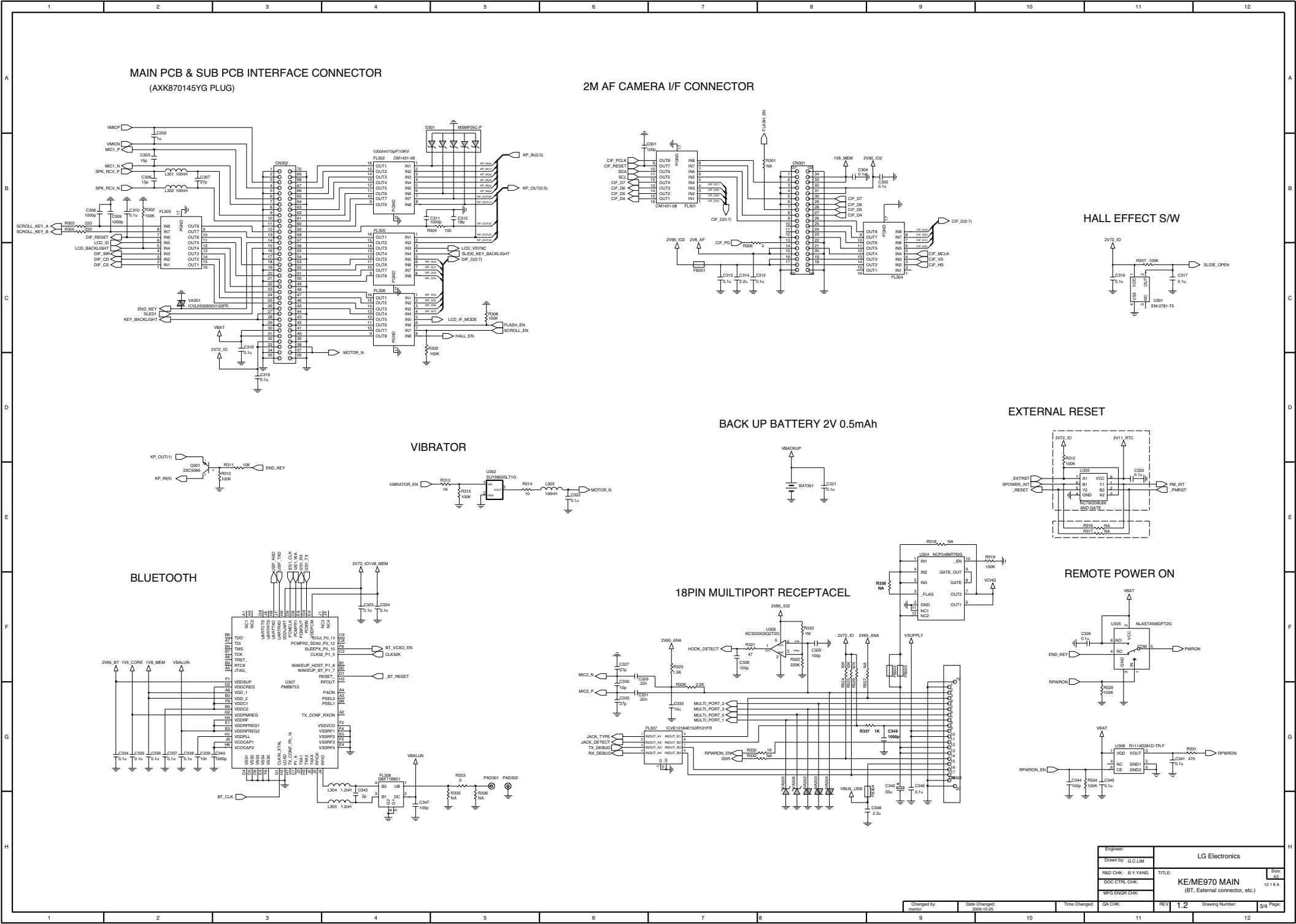
## 7. CIRCUIT DIAGRAM



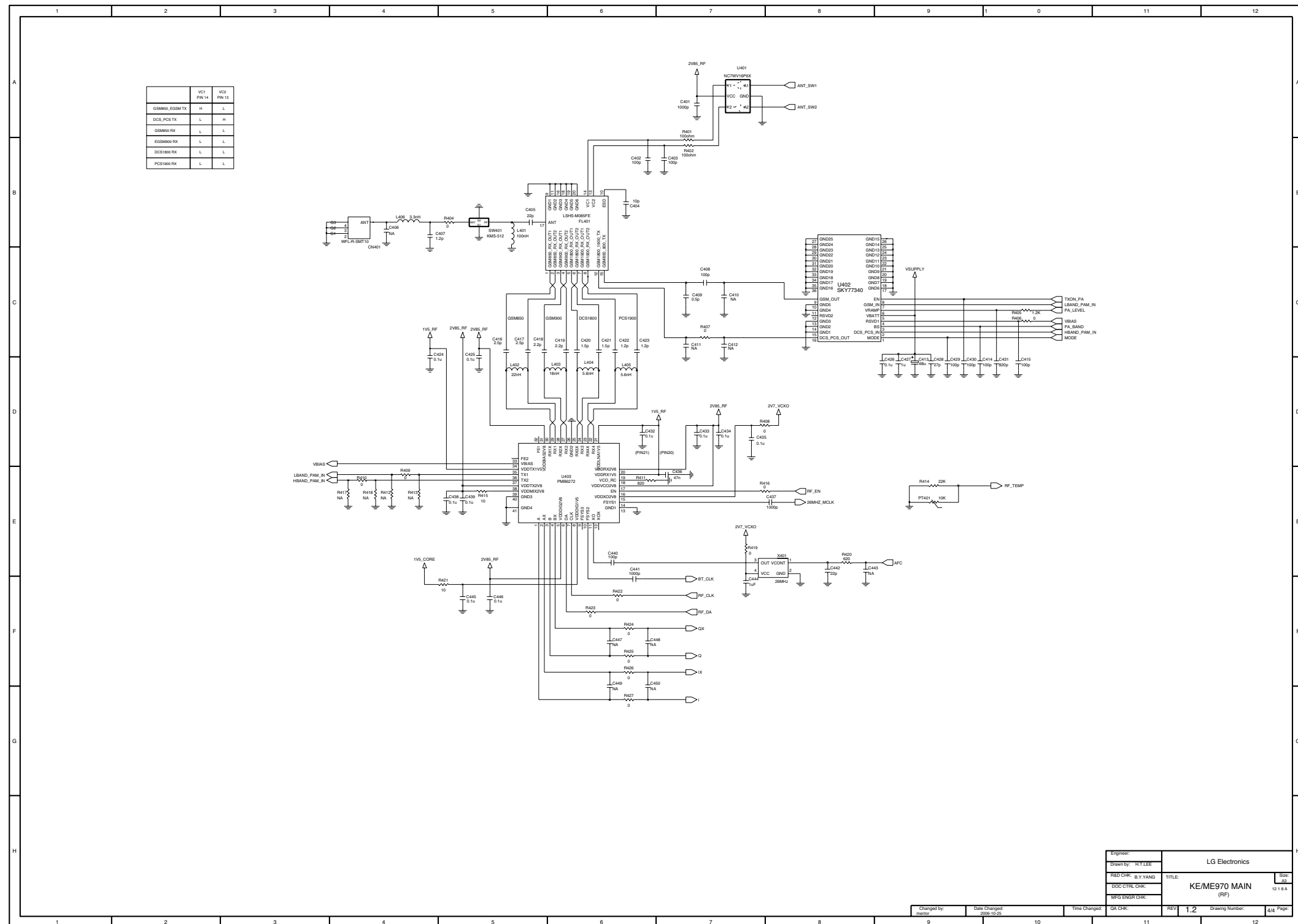
# 7. CIRCUIT DIAGRAM



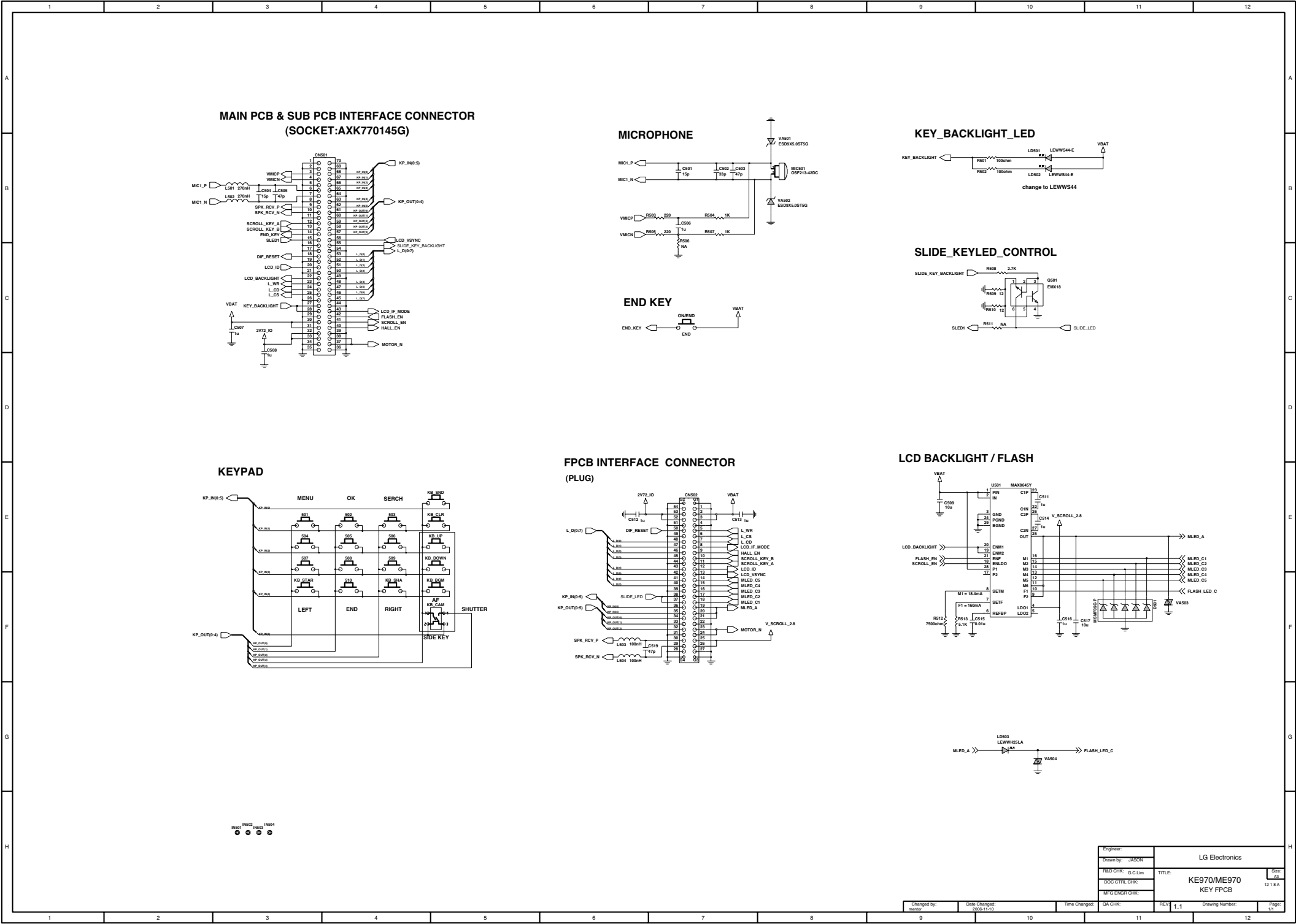
7. CIRCUIT DIAGRAM



## 7. CIRCUIT DIAGRAM

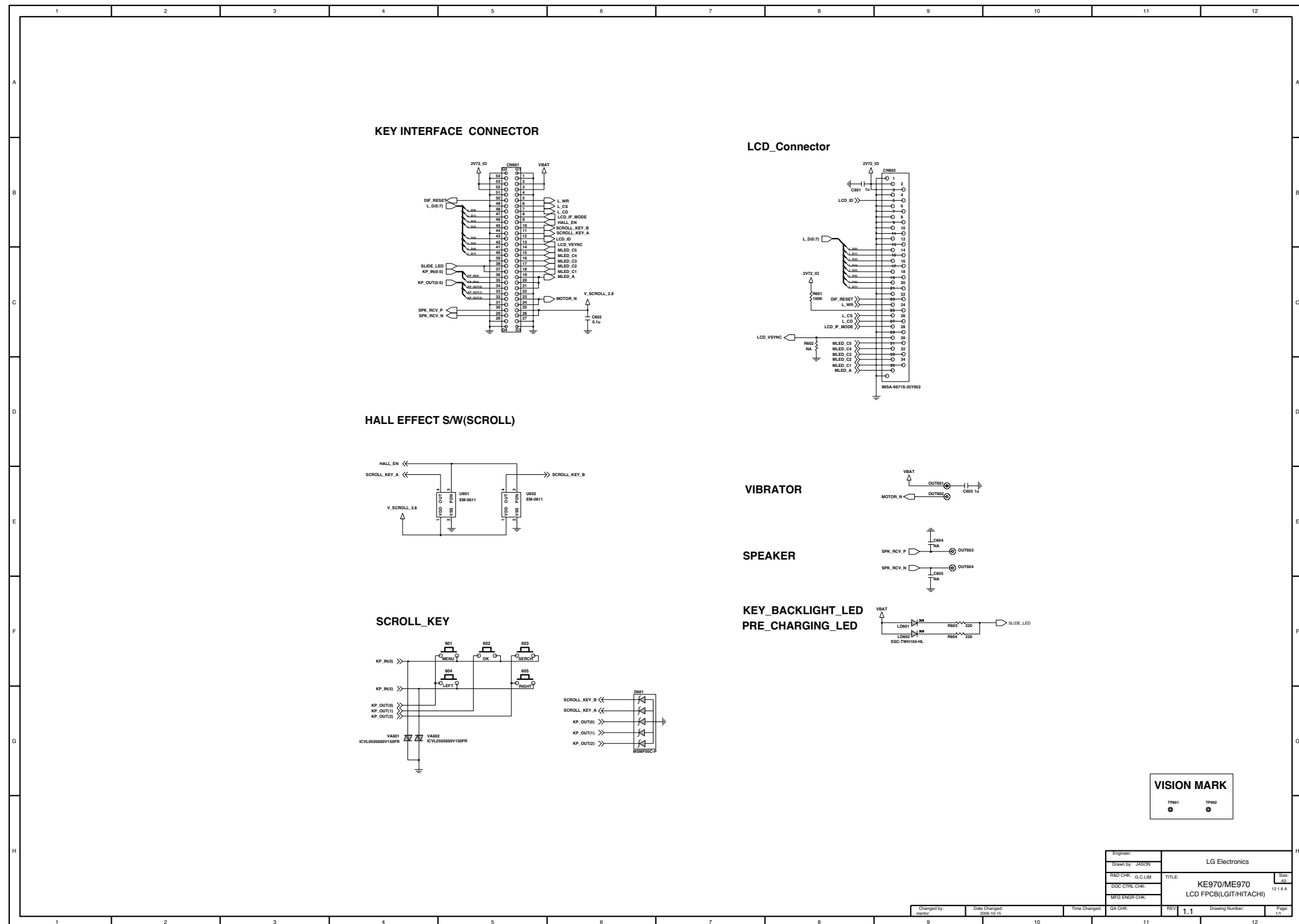


7. CIRCUIT DIAGRAM

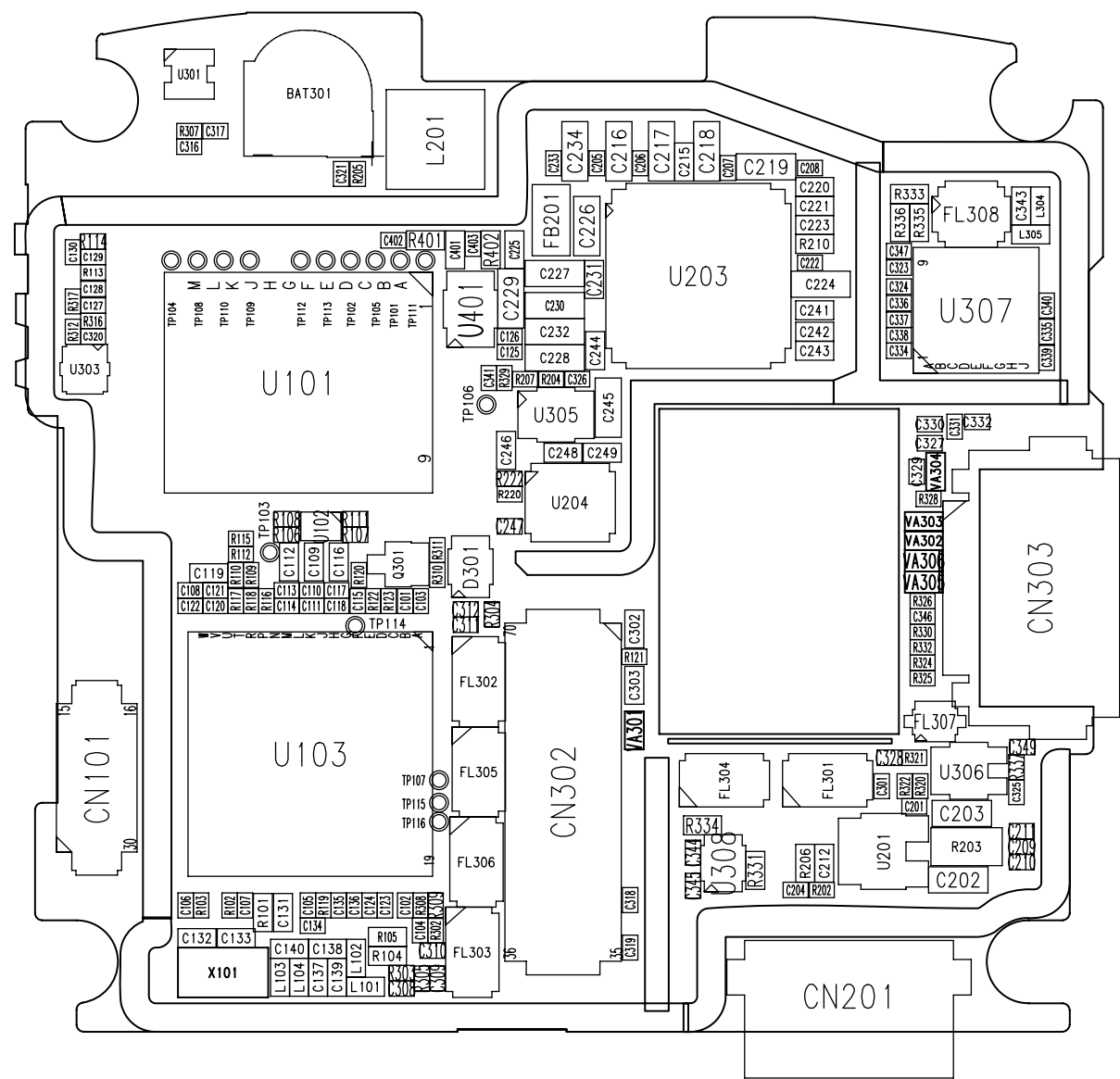




## 7. CIRCUIT DIAGRAM

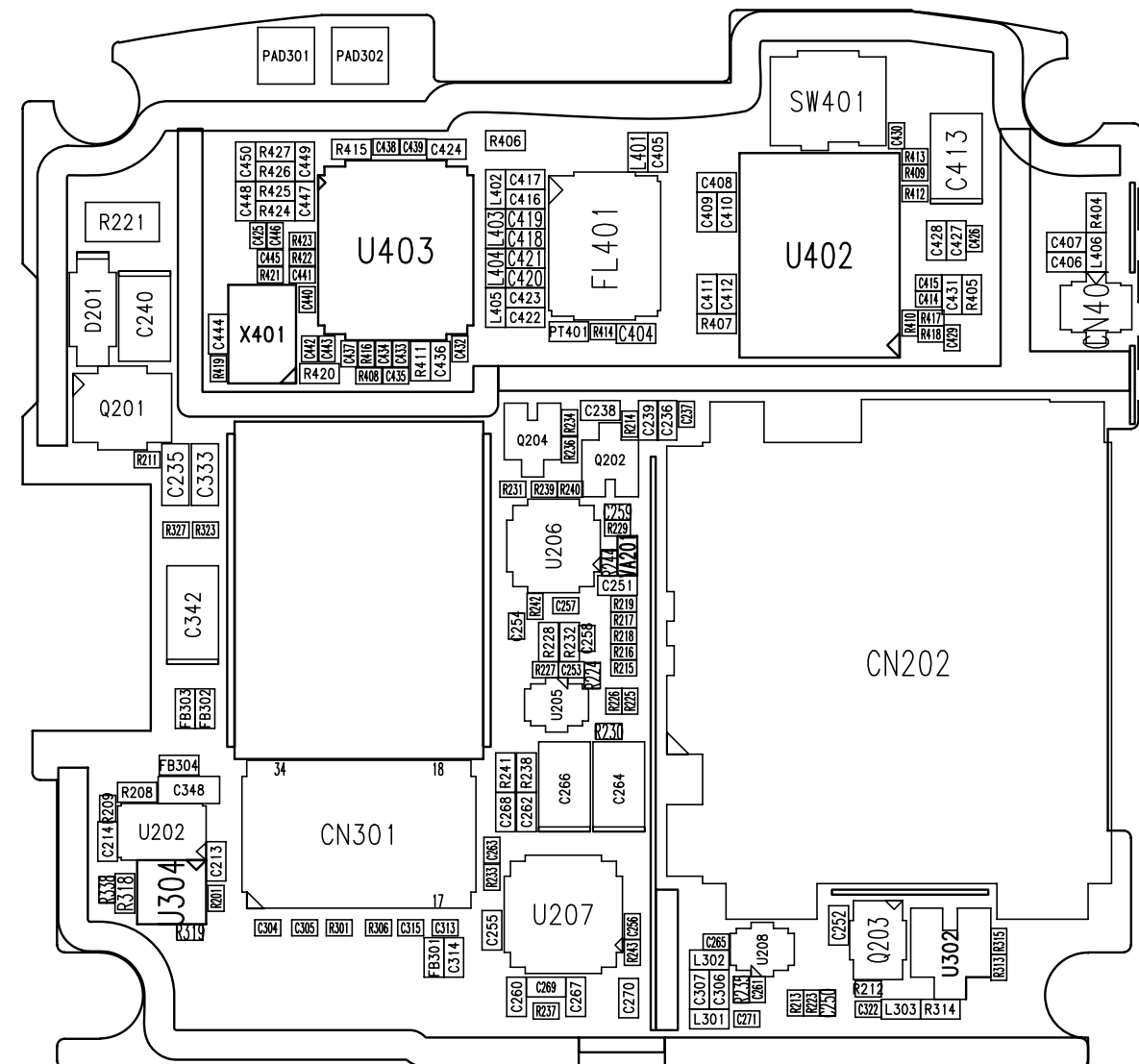


8. PCB LAYOUT



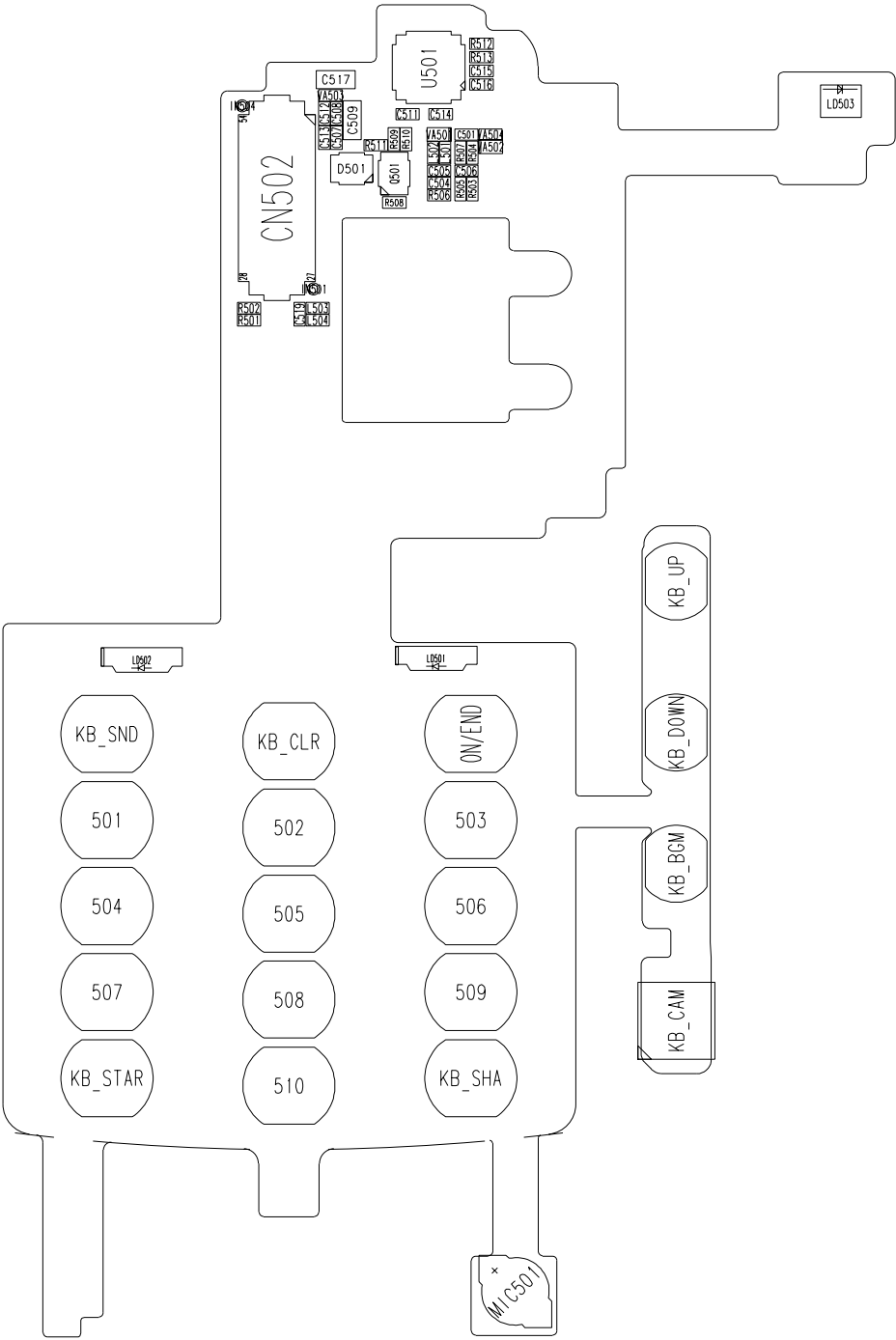
KE970-MAIN-SPFY0136901-1.2-BOTTOM

## 8. PCB LAYOUT



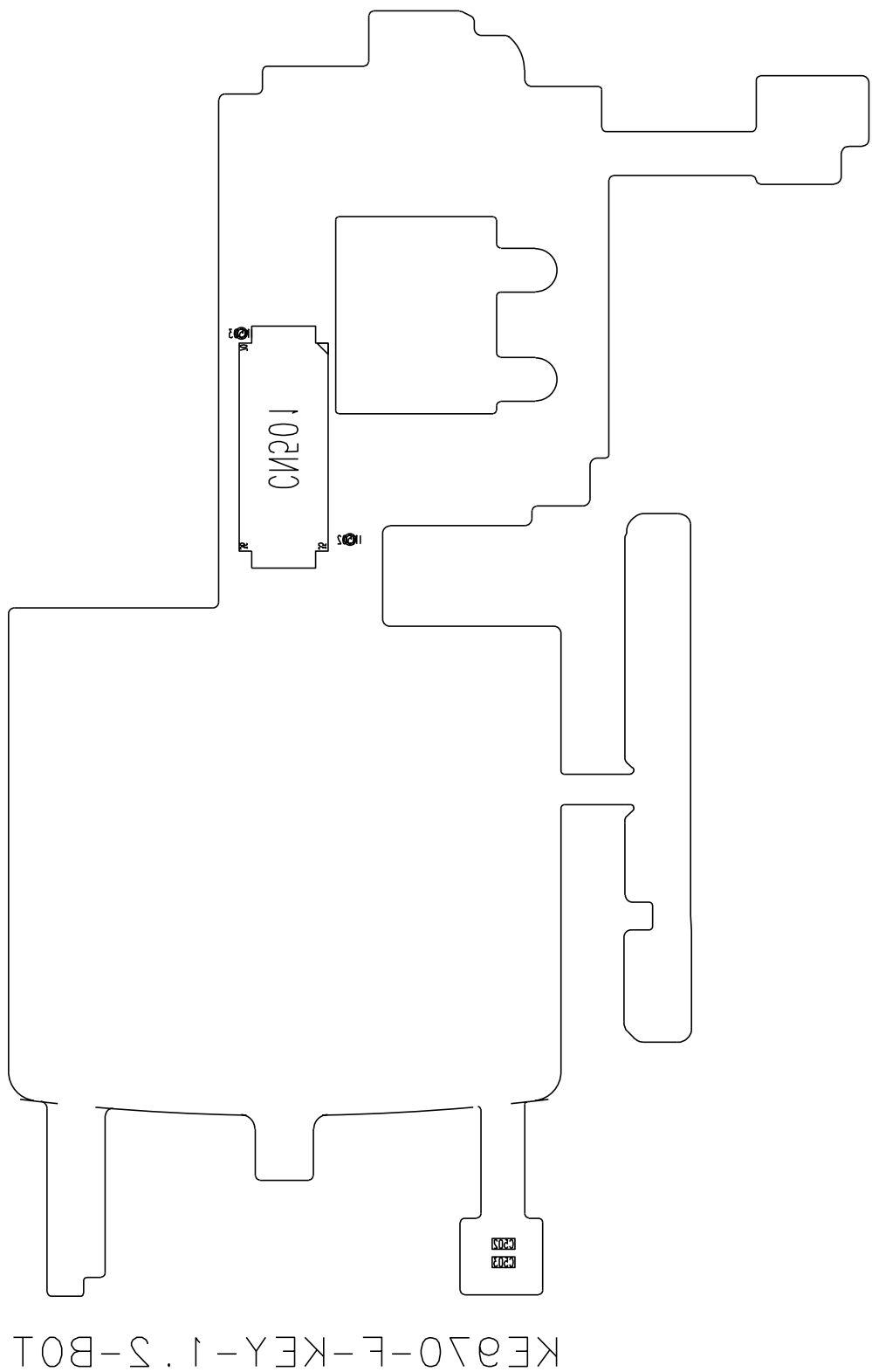
KE970-MAIN-SPFY0136901-1.2-TOP

8. PCB LAYOUT

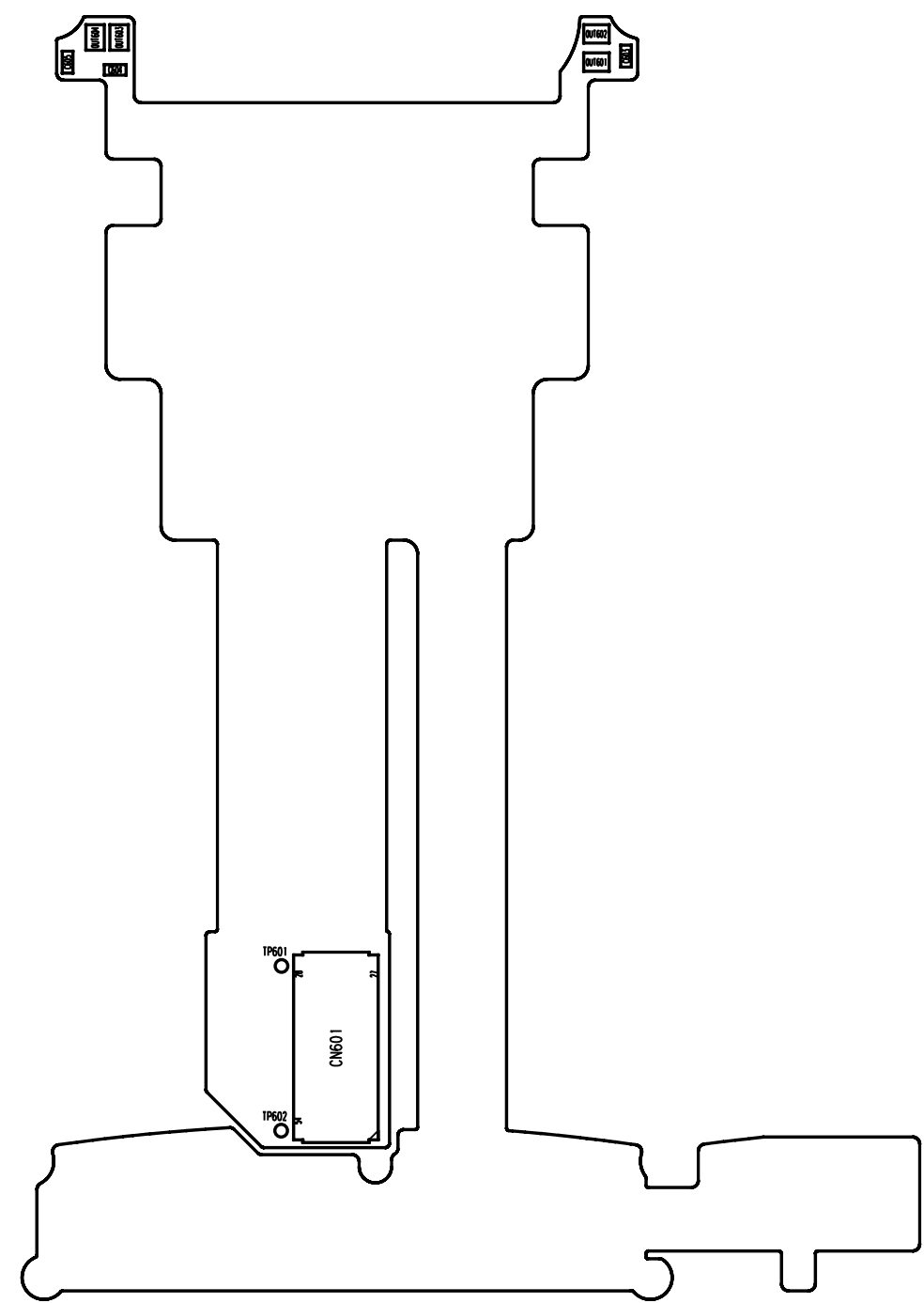


KE970-F-KEY-1.2-TOP

8. PCB LAYOUT

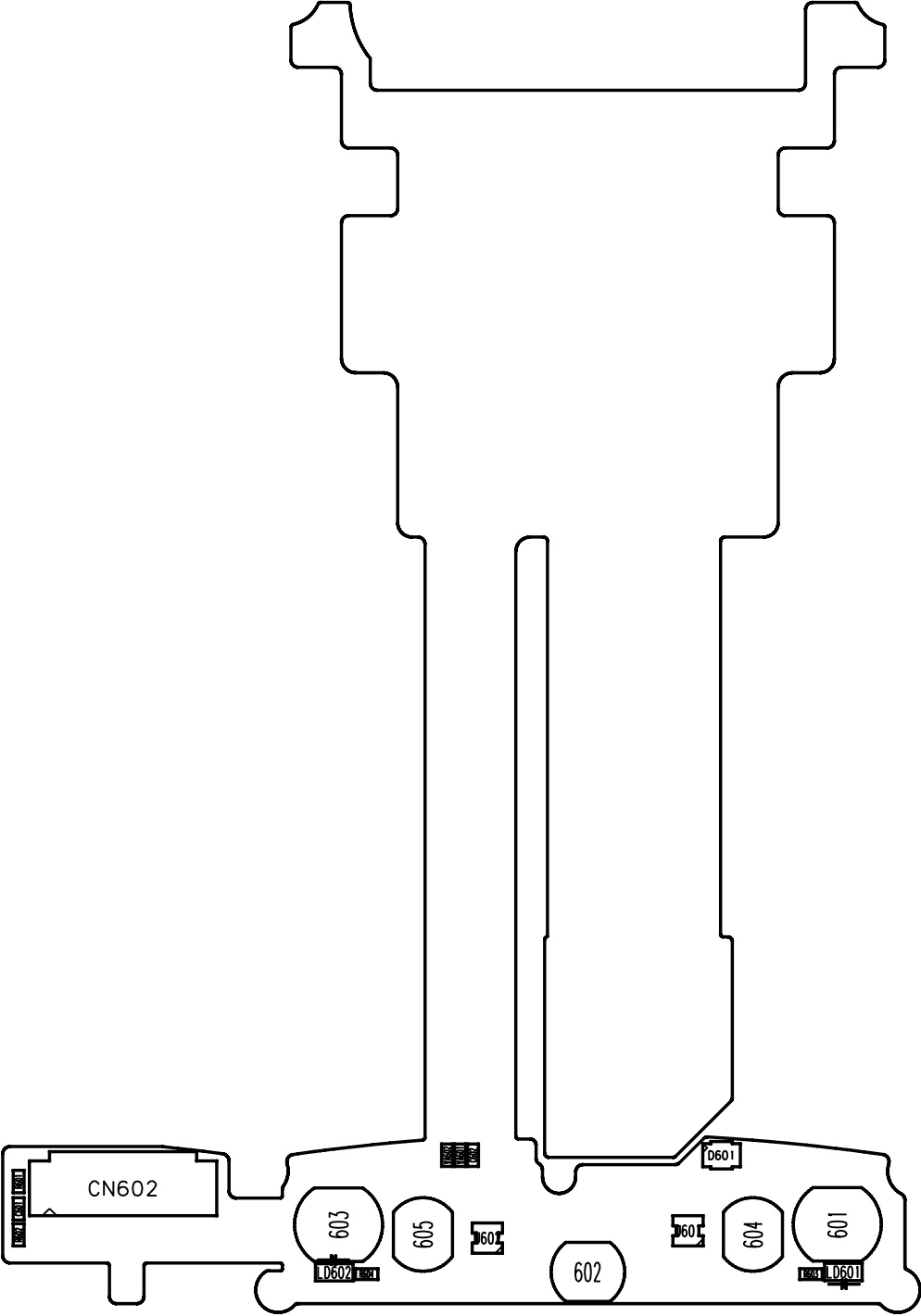


8. PCB LAYOUT



KE970-F\_LCD-SPCY0088301-1.1

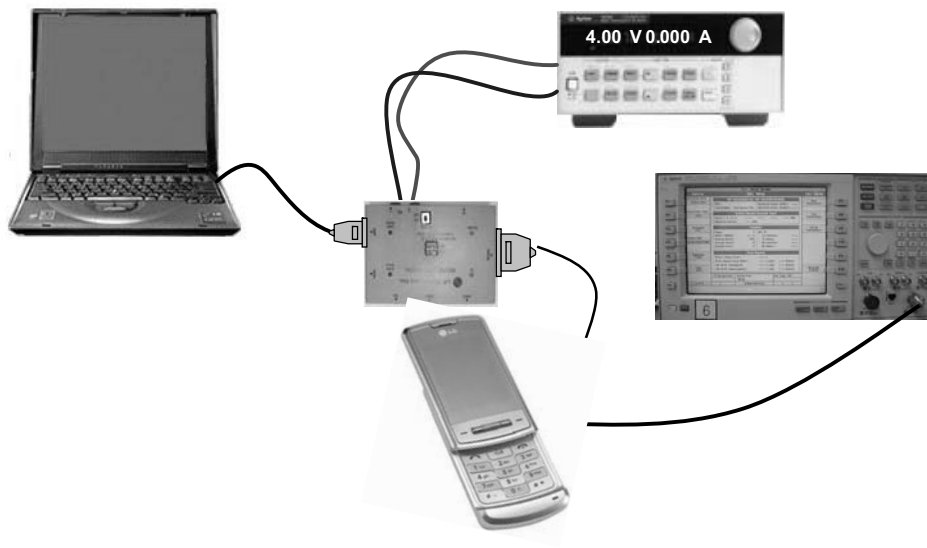
8. PCB LAYOUT



KE970-F\_LCD-SPCY0088301-1.1

## 9. RF Calibration

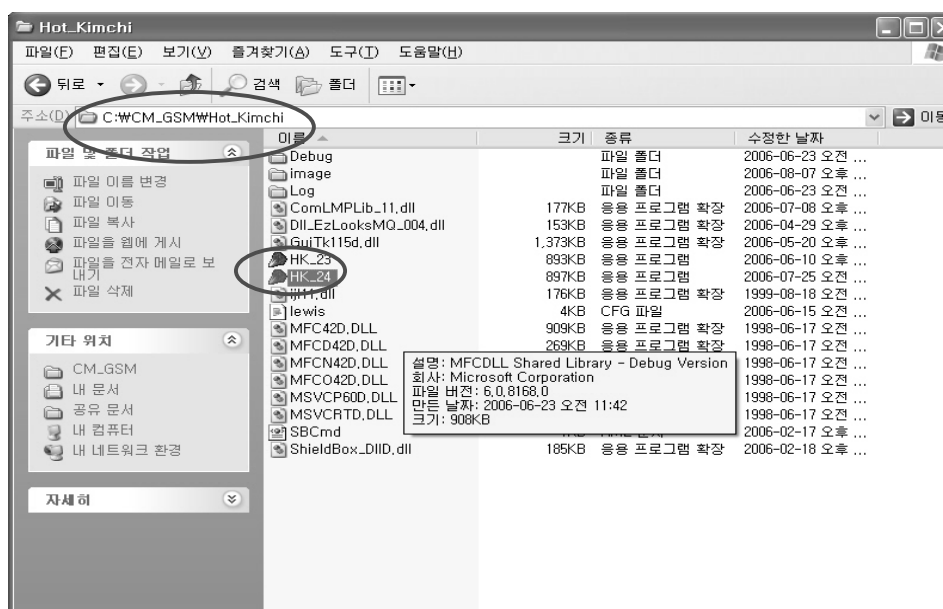
### 9.1 Test Equipment Setup



### 9.2 Calibration Steps

#### 9.2.1. Turn on the Phone.

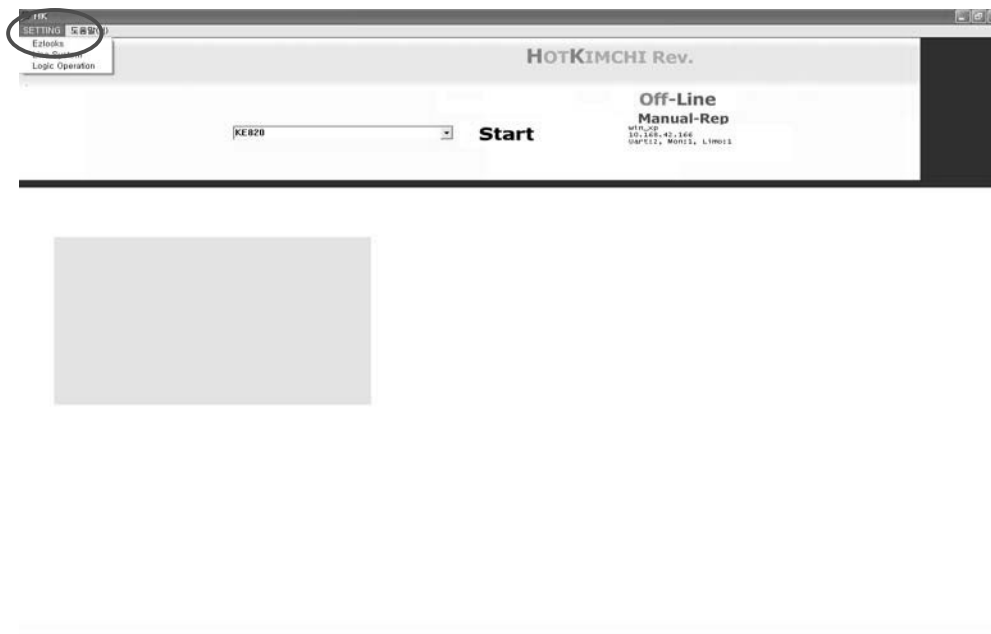
#### 9.2.2. Execute “HK\_24.exe”



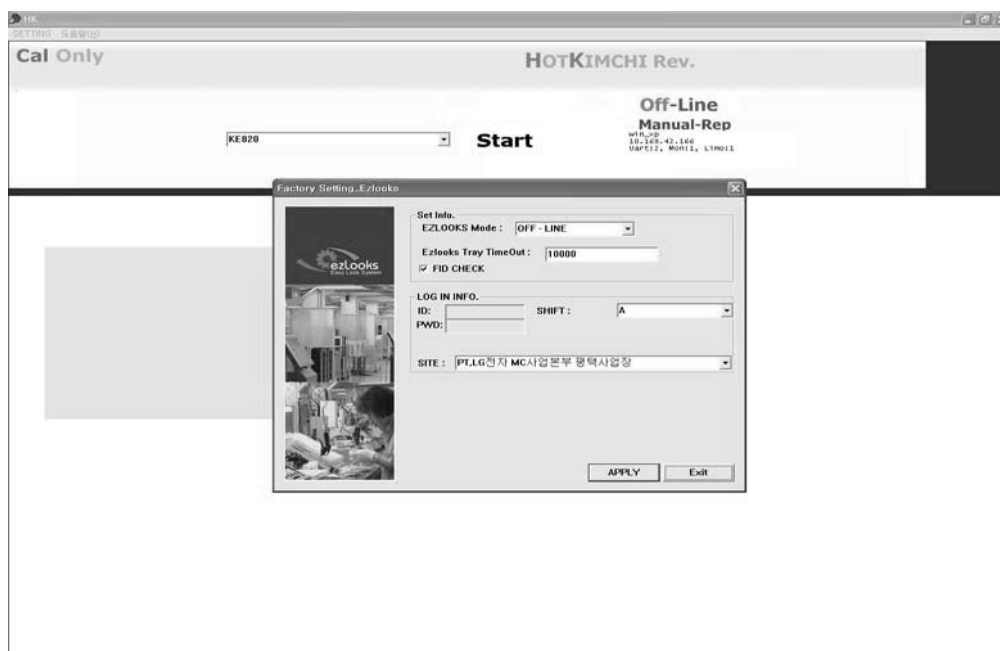


## 9. RF Calibration

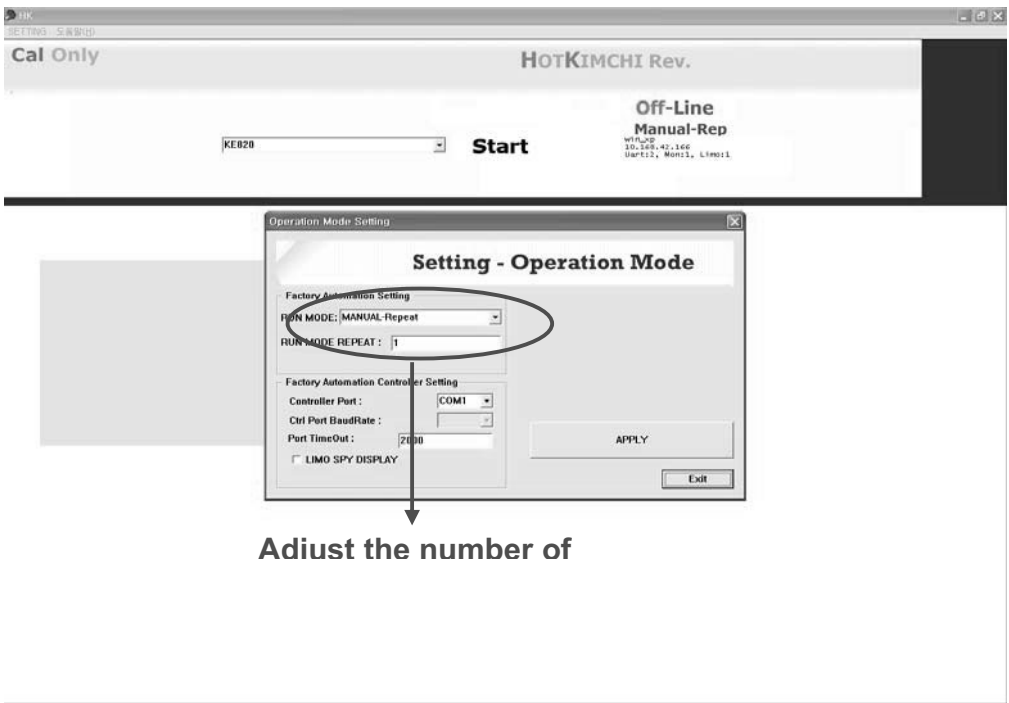
### 9.2.3. Click “SETTING” Menu



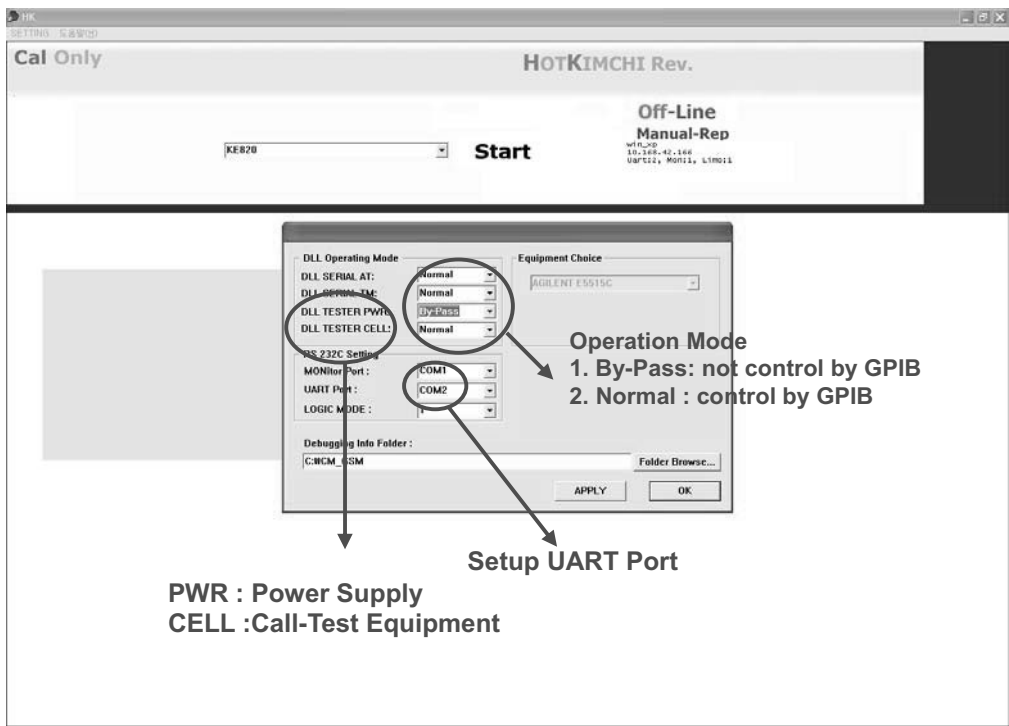
### 9.2.4. Setup “Ezlooks” menu such as the following figure



9.2.5. Setup “Line System” menu such as the following figure



9.2.6. Setup Logic operation such as the following figure.



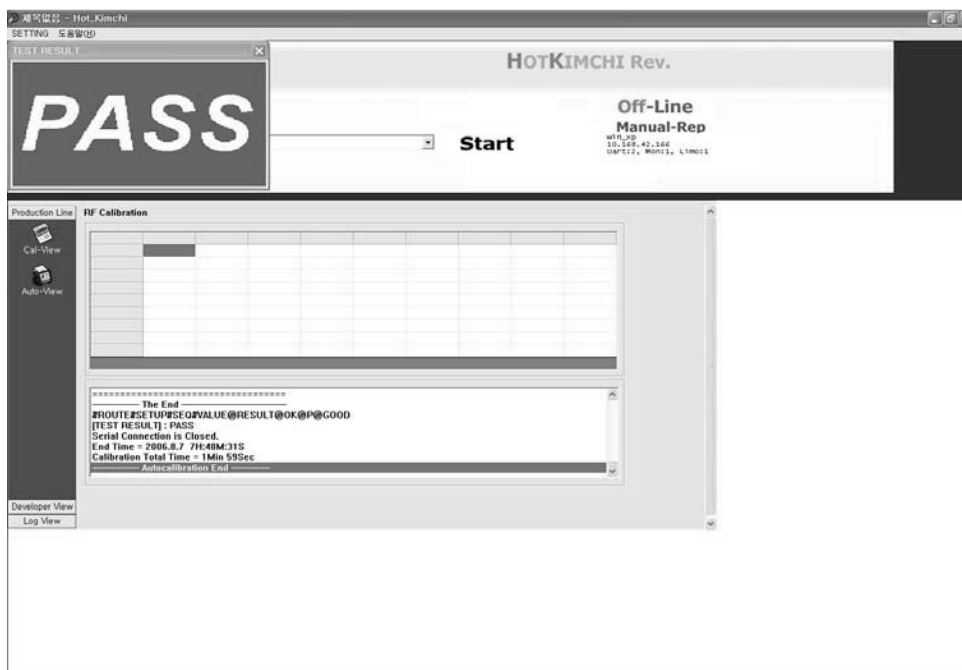
## 9. RF Calibration

### 9.2.7. Select “MODEL”.

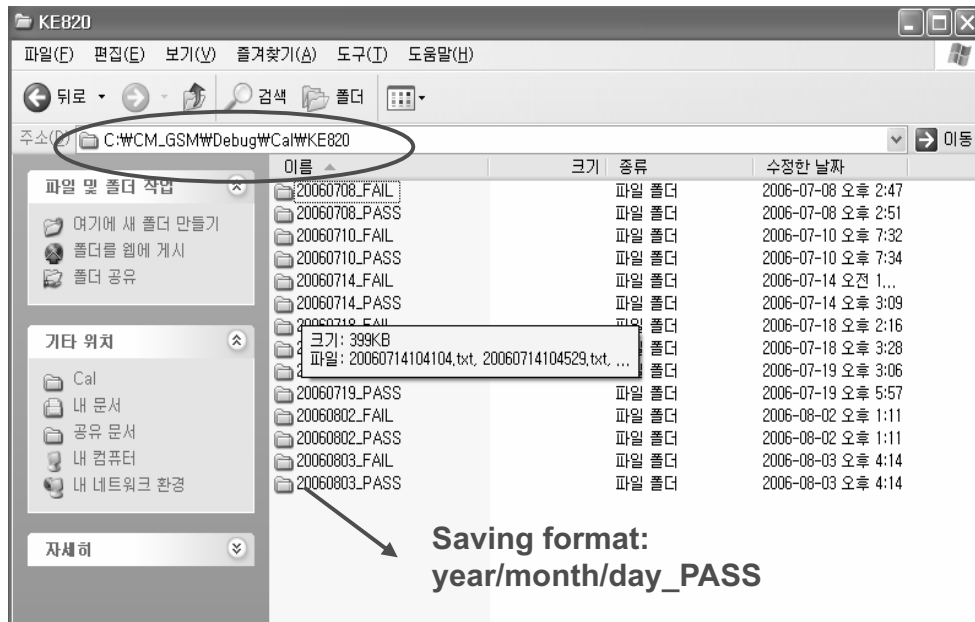
### 9.2.8. Click “START” for RF calibration



### 9.2.9. RF Calibration finishes.



### 9.2.10. Calibration data will be saved to the following folder.

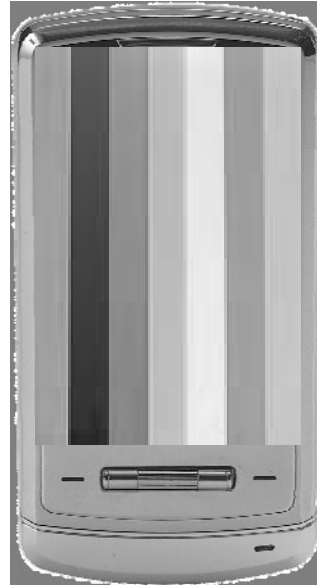


## 6. Download & S/W upgrade

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### Notices:

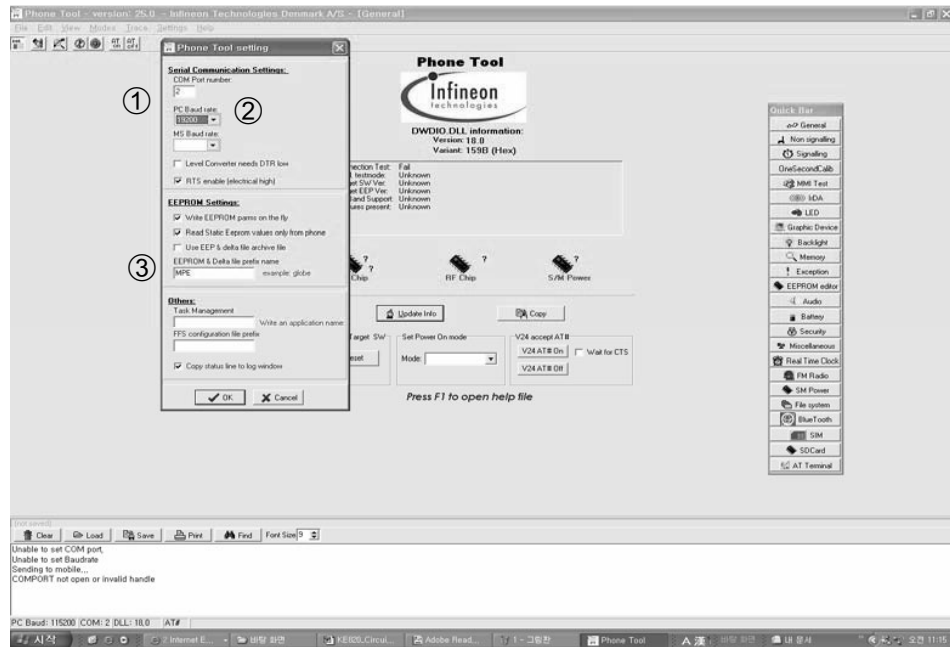
1. The state of Phone is “ test mode “ during the CALIBRATION.
2. Calibration program automatically changes either “normal mode” or “ptest mode”.
3. RF Calibration steps as follow:  
TX Channel compensation: EGSM->DCS->PCS->EDGE EGSM->EDGE DCS->EDGE PCS  
RX Channel compensation: EGSM->DCS->PCS
4. Phone Operation Mode



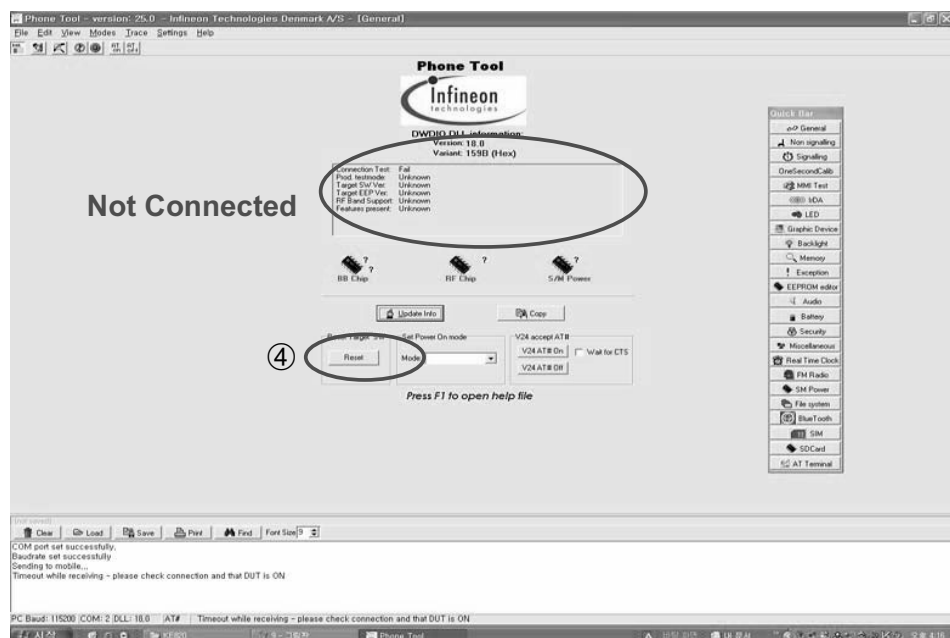
## 10. Stand along

### 10.1. Test Program Setting

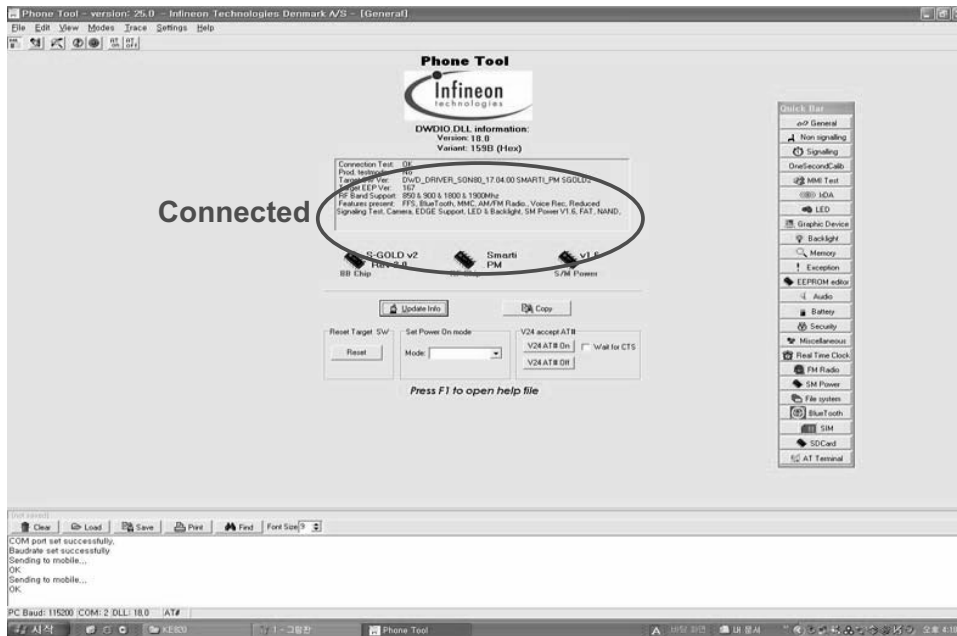
- ① Set COM Port.
- ② Check PC Baud rate.
- ③ Confirm EEPROM & Delta file prefix name.



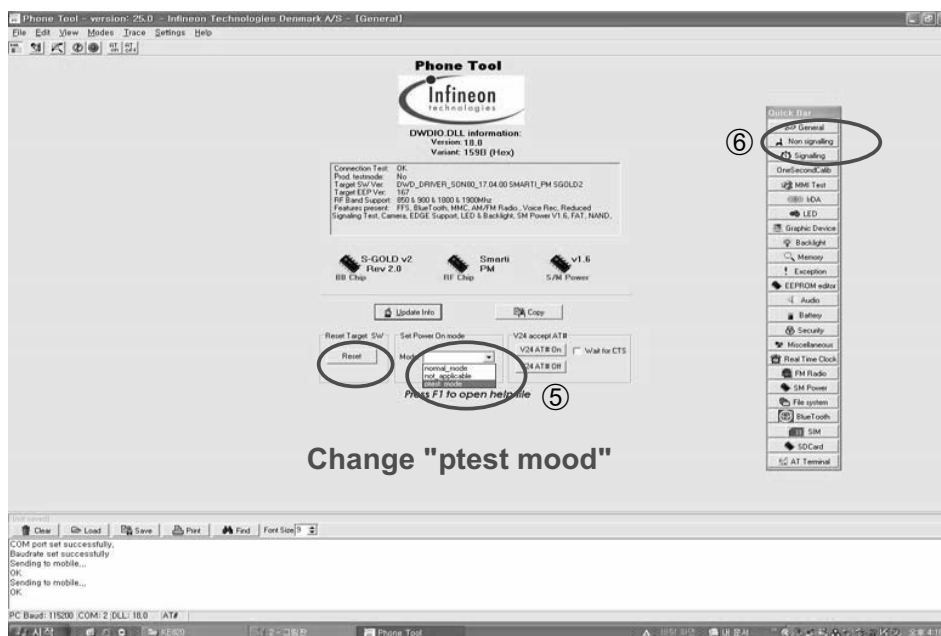
- ④ Click "Update Info" for communicating Phone and Test -Program.



## 10. Stand along

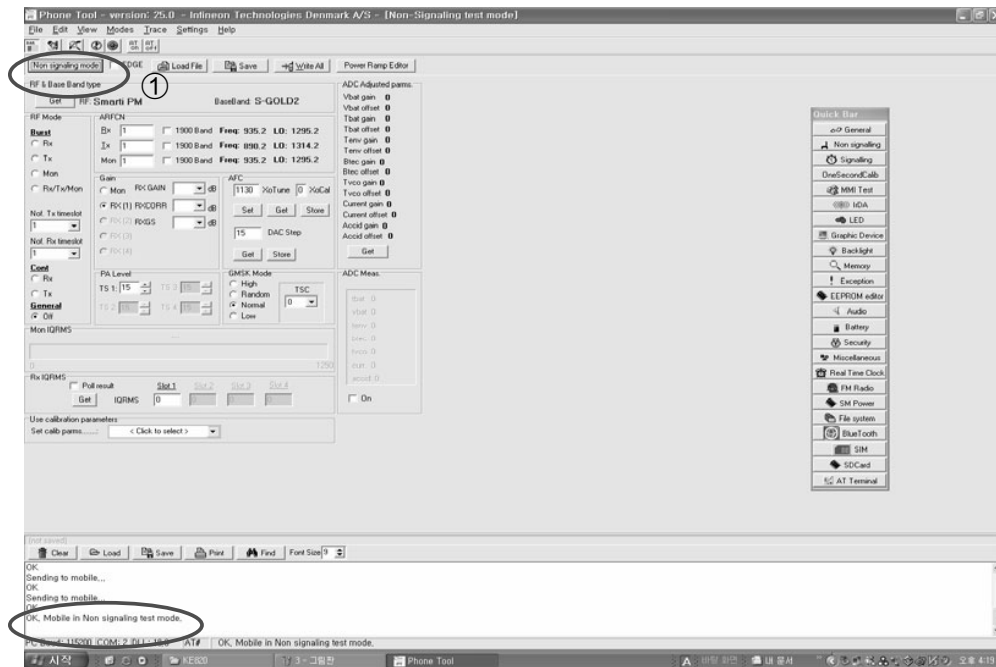


- ⑤ For the purpose of the Standalone Test, Change the Phone to "ptest mode" and then Click the "Reset" bar.
- ⑥ Select "Non signaling" in the Quick Bar menu. Then Standalone Test setup is finished.

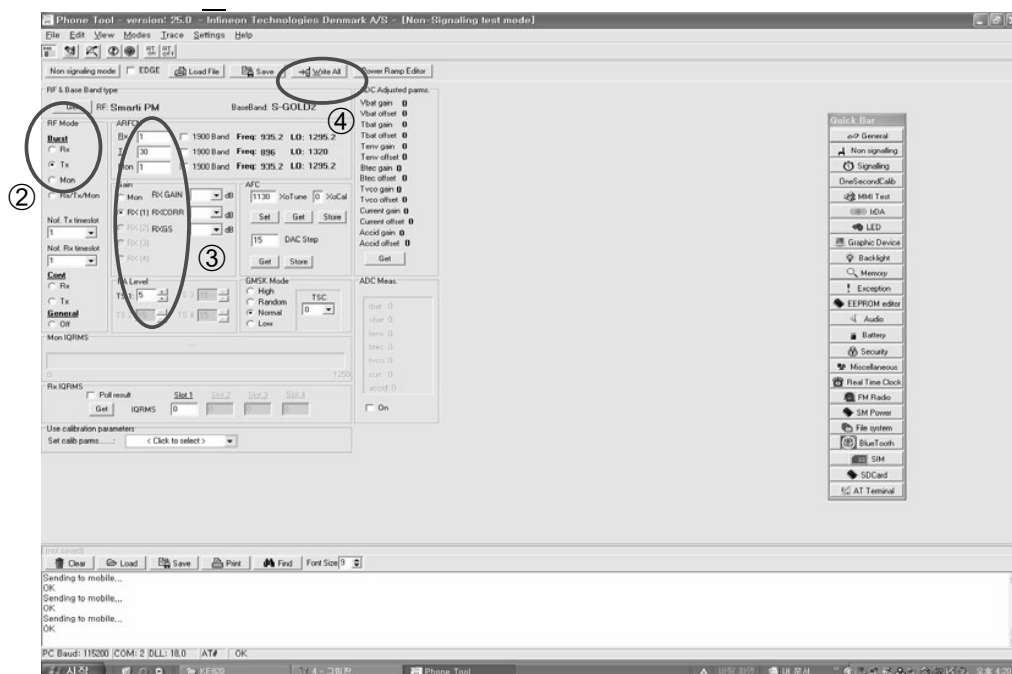


### 10.2. Tx Test

- ① Click “Non signaling mode” bar and then confirm “OK” text in the command line.



- ② Put the number of TX Channel in the ARFCN.
- ③ Select “Tx” in the RF mode menu and “PCL” in the PA Level menu.
- ④ Finally, Click “Write All” bar and try the efficiency test of Phone.

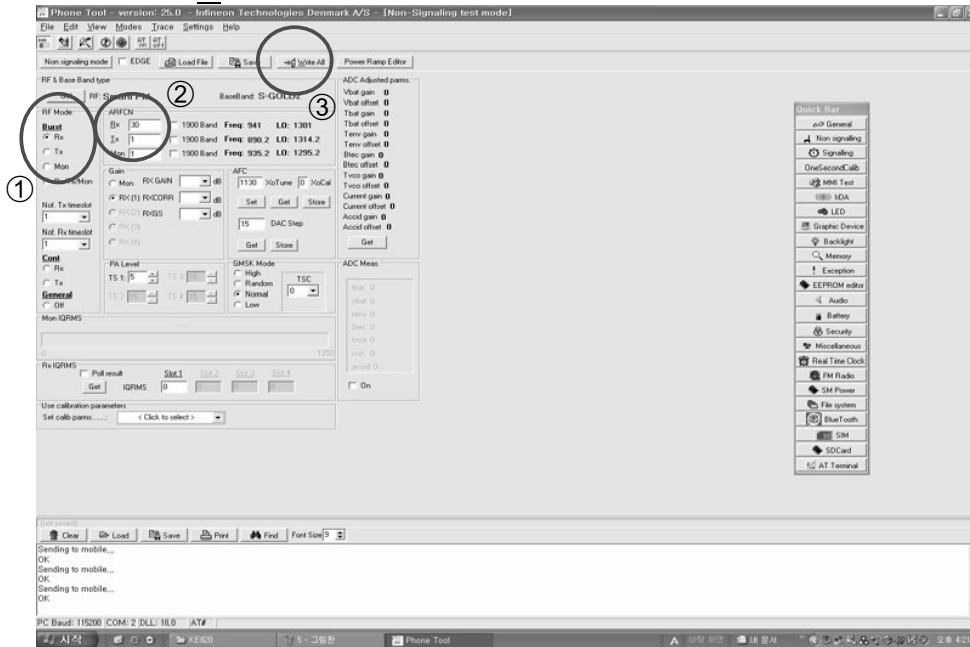




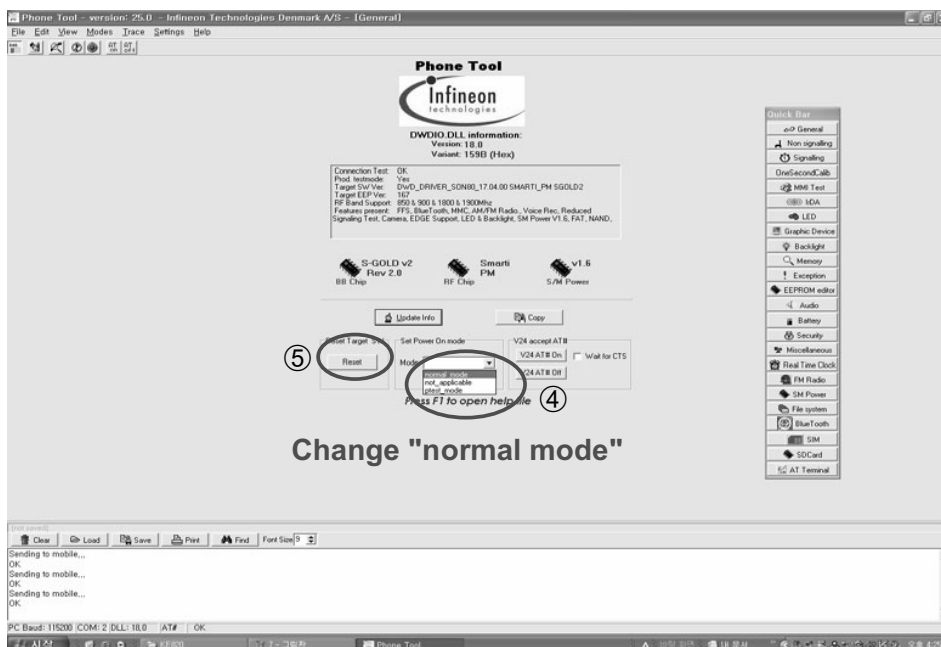
## 10. Stand along

### 10.3. Rx Test

- ① Put the number of RX Channel in the ARFCN.
- ② Select "Rx" in the RF mode menu.
- ③ Finally, Click "Write All" bar and try the efficiency test of Phone.



- ④ The Phone must be changed "normal mode" after finishing Test.
- ⑤ Change the Phone to "normal mode" and then Click the "Reset" bar.



Change "normal mode"

# 11. ENGINEERING MODE

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset. The key sequence for switching the engineering mode on is "2945#\*#" Select. Pressing END will switch back to non-engineering mode operation. Use Up and Down key to select a menu and press 'select' key to progress the test. Pressing back key will switch back to the original test menu.

### [1] BB test

#### [1-1] Battery Info

[1-1-1] BattInfo

#### [1-2] Bluetooth Test

[1-2-1] Enter Test Mode

[1-2-1-1] Audio Test

[1-2-1-2] RF Test

[1-2-2] OnOff Test

[1-2-2-1] Bluetooth On

[1-2-2-1] Bluetooth Off

[1-2-3] Headset Test

[1-2-4] Communication Mode

[1-2-5] Xhtml compose print

[1-2-6] Xhtml Print Test

### [2] Model Version test

#### [2-1] Version

### [3] ENG MODE

#### [3-1] CELL ENVIRON

#### [3-2] PS Layer Info

[3-2-1] Mobility

[3-2-2] RadioRes

[3-2-3] Gprs

#### [3-3] LAYER1 INFO

[3-3-1] Close

#### [3-4] Reset Information

[3-4-1] Excpt

#### [3-5] Memory Configuration

#### [3-6] MenGenConf

#### [3-7] MemAllUse

#### [3-8] MemDetUse

#### [3-9] MemDump

#### [3-0] Change Frequency Band

[3-0-1] Close

### [4] Call Timer

### [5] Factory Reset

### [6] MF Test

#### [6-1] All Auto Test

#### [6-2] Backlight

[6-2-1] Backlight On

[6-2-1] Backlight Off

#### [6-3] Audio

[6-3-1] Audio test

#### [6-4] Vibrator

[6-4-1] Vibrator on

[6-4-2] Vibrator off

#### [6-5] LCD

[6-5-1] Auto LCD

#### [6-6] Key pad

#### [6-7] Mic Speaker

#### [6-8] Camera

[6-8-1] Camera Main Preview

[6-8-2] Flash On

[6-8-2] Flash Off

### [7] DRM Engineering Mode

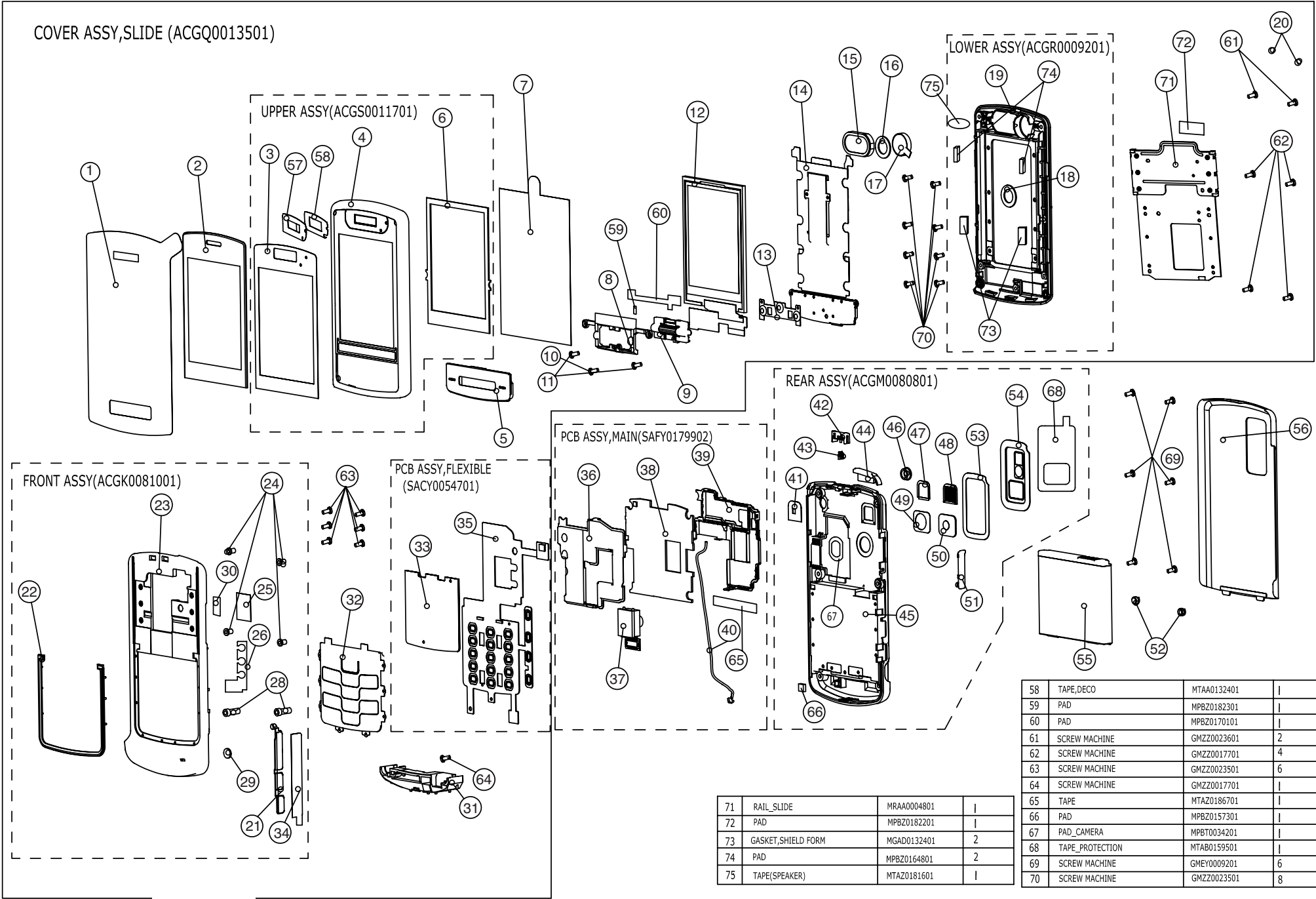
#### [7-1] GetAllRoTable

#### [7-2] GetRoTable

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12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW



NO	DESCRIPTION	PAERT_NO	Q'TY
1	TAPE_PROTECTION	MTAB0166101	1
2	WINDOW_LCD	MWAC0073501	1
3	TAPE_WINDOW	MTAD0064801	1
4	COVER_SLIDE(UPPER)	MCJW0009201	1
5	KEYPAD_FUNCTION	MKAC0009001	1
6	PAD_LCD	MPBG0056801	1
7	TAPE_PROTECTION	MTAB0166201	1
8	DECO	MDAY0035401	1
9	SWITCH_ROTARY	ESQY0000801	1
10	SCREW	GMEY0015401	2
11	SCREW	GMZZ0017701	1
12	LCD	SVLM0021001	1
13	SHEET	MSAZ0042501	1
14	SLIDE-FPCB	SACY0054601	1
15	SPEAKER	SUSY0024101	1
16	PAD_MOTOR	MPBJ0040801	1
17	MOTOR	SJMY0008404	1
18	PAD_MOTOR	MPBJ0039301	1
19	COVER_SLIDE(LOWER)	MCJV0009401	1
20	CAP_SCREW	MCCH0100901	2
21	BUTTON_SIDE	MBJL0036601	1
22	DECO_FRONT	MDAG0024901	1
23	COVER_FRONT	MCJK0065401	1
24	INSERT	MICZ0028901	4
25	TAPE	MTAZ0162701	1
26	TAPE	MTAZ0186101	1
28	INSERT	MICZ0028801	2
29	FILTER_MIKE	MFBD0018901	1
30	GASKET	MGAZ0052401	1
31	ANTENNA	SNGF0022501	1
32	BUTTON_DIAL	MBJA0022401	1
33	DOME_ASSY_METAL	ADCA0060201	1
34	TAPE_PROTECTION	MTAB0140001	1
35	KEY-PCB	SPCY0088201	1
36	CAN_SHIELD	MCBA0012801	1
37	CAMERA	SVCY0012801	1
38	MAIN-PCB	SPFY0136901	1
39	CAN_SHIELD	MCBA0012901	1
40	CABLE	SWCC0003901	1
41	PAD	MPBZ0173201	1
42	LOCKER_BATTERY	MLEA0034801	1
43	SPRING_COIL	MSDB0003701	1
44	BLUETOOTH_ANTENNA	SNGF0022601	1
45	COVER_REAR	MCJN0059801	1
46	CAP_MOBILE_SWITCH	MCCF0037701	1
47	TAPE	MTAZ0162601	1
48	LENS_FLASH	MLCE0007001	1
49	TAPE_WINDOW	MTAD0060201	1
50	WINDOW_CAMERA	MWAE0021701	1
51	CAP_EARPHONE JACK	MCCC0043501	1
52	CAP_SCREW	MCCH0097401	2
53	TAPE_DECO	MTAA0127001	1
54	DECO_CAMERA	MDAD0026901	1
55	INNER_BATTERY	SBPL 0085703	1
56	COVER_BATTERY	MCJA0037301	1
57	FILTER_SPEAKER	MFBC0025301	1

71	RAIL_SLIDE	MRAA0004801	1
72	PAD	MPBZ0182201	1
73	GASKET_SHIELD FORM	MGAD0132401	2
74	PAD	MPBZ0164801	2
75	TAPE(SPEAKER)	MTAZ0181601	1

58	TAPE_DECO	MTAA0132401	1
59	PAD	MPBZ0182301	1
60	PAD	MPBZ0170101	1
61	SCREW MACHINE	GMZZ0023601	2
62	SCREW MACHINE	GMZZ0017701	4
63	SCREW MACHINE	GMZZ0023501	6
64	SCREW MACHINE	GMZZ0017701	1
65	TAPE	MTAZ0186701	1
66	PAD	MPBZ0157301	1
67	PAD_CAMERA	MPBT0034201	1
68	TAPE_PROTECTION	MTAB0159501	1
69	SCREW MACHINE	GMEY0009201	6
70	SCREW MACHINE	GMZZ0023501	8



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.2 Replacement Parts <Mechanic component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No	Description	Part Number	Spec	Color	Remark
1		GSM(SLIDE)	TGLL0006901		Aluminum Silver	
2	AAAY00	ADDITION	AAAY0180102		Aluminum Silver	
3	MCJA00	COVER,BATTERY	MCJA0037301	PRESS, STS, , , , ,	Silver	56
2	APEY00	PHONE	APEY0370401	KE970 EUAAV	Aluminum Silver	
3	ACGM00	COVER ASSY,REAR	ACGM0080801	KE970_COVER ASSY,REAR	Aluminum Silver	
4	MCCC00	CAP,EARPHONE JACK	MCCC0043501	MOLD, Urethane Rubber S195A, , , , ,	Without Color	51
4	MCCF00	CAP,MOBILE SWITCH	MCCF0037701	MOLD, Urethane Rubber S195A, , , , ,	Silver	46
4	MCJN00	COVER,REAR	MCJN0059801	MOLD, PC LUPOY SC-1004A, , , , ,	Black	45
4	MDAD00	DECO,CAMERA	MDAD0026901	ELECTROFORMING, Ni, , , , ,	Silver	54
4	MLAB00	LABEL,A/S	MLAB0000601	HUMIDITY STICKER	Without Color	
4	MLCE00	LENS,FLASH	MLCE0007001	MOLD, PMMA HI835M, , , , ,	Transparent	48
4	MLEA00	LOCKER,BATTERY	MLEA0034801	MOLD, POM LUCCEL FW-700A, , , , ,	Silver	42
4	MPBT00	PAD,CAMERA	MPBT0034201	COMPLEX, (empty), , , , ,	Black	67
4	MPBZ00	PAD	MPBZ0157301	COMPLEX, (empty), , , , ,	Black	66
4	MPBZ01	PAD	MPBZ0173201	COMPLEX, (empty), , , , ,	Without Color	41
4	MSDB00	SPRING,COIL	MSDB0003701	COMPLEX, (empty), , , , ,	Without Color	43
4	MTAA00	TAPE,DECO	MTAA0127001	COMPLEX, (empty), , , , ,	Without Color	53
4	MTAB01	TAPE,PROTECTION	MTAB0159501	COMPLEX, (empty), , , , ,	Without Color	68
4	MTAD00	TAPE,WINDOW	MTAD0060201	COMPLEX, (empty), , , , ,	Without Color	49
4	MTAZ00	TAPE	MTAZ0162601	COMPLEX, (empty), , , , ,	Without Color	47
4	MTAZ01	TAPE	MTAZ0171701	COMPLEX, (empty), , , , ,	Without Color	
4	MWAE00	WINDOW,CAMERA	MWAE0021701	COMPLEX, (empty), , , , ,	Black	50
3	ACGQ00	COVER ASSY,SLIDE	ACGQ0013501	KE970/ME970_COVER ASSY,SLIDE	Aluminum Silver	
4	ACGK00	COVER ASSY,FRONT	ACGK0081001	ME970_COVER ASSY,FRONT	Aluminum Silver	
5	MBJL00	BUTTON,SIDE	MBJL0036601	MOLD, PC LUPOY SC-1004A, , , , ,	Silver	21
5	MCJK00	COVER,FRONT	MCJK0065401	MOLD, PC LUPOY SC-1004A, , , , ,	Silver	23
5	MDAG00	DECO,FRONT	MDAG0024901	MOLD, POM LUCCEL FW-700A, , , , ,	Gray	22
5	MFBD00	FILTER,MIKE	MFBD0018901	COMPLEX, (empty), , , , ,	Black	29
5	MGAZ00	GASKET	MGAZ0052401	COMPLEX, (empty), , , , ,	Silver	30
5	MICZ00	INSERT	MICZ0028801	COMPLEX, (empty), , , , ,	Gold	28

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
5	MICZ01	INSERT	MICZ0028901	COMPLEX, (empty), , , , ,	Gold	24
5	MTAB00	TAPE,PROTECTION	MTAB0140001	COMPLEX, (empty), , , , ,	Green	34
5	MTAZ00	TAPE	MTAZ0162701	COMPLEX, (empty), , , , ,	Without Color	25
5	MTAZ01	TAPE	MTAZ0186101	COMPLEX, (empty), , , , ,	Without Color	26
4	ACGR00	COVER ASSY,SLIDE(LOWER)	ACGR0009201		Aluminum Silver	
5	MCJV00	COVER,SLIDE(LOWER)	MCJV0009401	MOLD, PC LUPOY SC-1004A, , , , ,	Aluminum Silver	19
5	MGAD00	GASKET,SHIELD FORM	MGAD0132401	COMPLEX, (empty), , , , ,	Aluminum Silver	73
5	MGDA00	GUIDE,LEFT	MGDA0007001	MOLD, POM LUCEL N109-LD, , , , ,	Gray	
5	MGDB00	GUIDE,RIGHT	MGDB0002901	MOLD, POM LUCEL N109-LD, , , , ,	Gray	
5	MICZ00	INSERT	MICZ0024601	C4605BD,M1.4x0.3pitch,1.7T,2.5PI	Without Color	
5	MICZ01	INSERT	MICZ0028501	COMPLEX, (empty), , , , ,	Without Color	
5	MMAA00	MAGNET,SWITCH	MMAA0006901	COMPLEX, (empty), , , , ,	Without Color	
5	MPBJ00	PAD,MOTOR	MPBJ0039301	COMPLEX, (empty), , , , ,	Aluminum Silver	18
5	MPBZ00	PAD	MPBZ0164801	COMPLEX, (empty), , , , ,	Black	74
5	MTAZ00	TAPE	MTAZ0181601	COMPLEX, (empty), , , , ,	Without Color	75
4	ACGS00	COVER ASSY,SLIDE(UPPER)	ACGS0011701		Silver	
5	MCJW00	COVER,SLIDE(UPPER)	MCJW0009201	PRESS, STS, , , , ,	Without Color	4
6	MDAY00	DECO	MDAY0034001	PRESS, STS, , , , ,	Without Color	
6	MFEZ00	FRAME	MFEZ0011801	PRESS, STS, , , , ,	Without Color	
6	MICZ00	INSERT	MICZ0028401	PRESS, STS, , , , ,	Without Color	
6	MICZ01	INSERT	MICZ0029301	COMPLEX, (empty), , , , ,	Without Color	
5	MFBC00	FILTER,SPEAKER	MFBC0025301	PRESS, STS, , , , ,	Black	57
5	MPBG00	PAD,LCD	MPBG0056801	COMPLEX, (empty), , , , ,	Black	6
5	MTAA00	TAPE,DECO	MTAA0132401	COMPLEX, (empty), , , , ,	Without Color	58
5	MTAD00	TAPE,WINDOW	MTAD0064801	COMPLEX, (empty), , , , ,	Without Color	3
4	GMEY01	SCREW MACHINE,BIND	GMEY0015401	1.4 mm,2.7 mm,MSWR3(BK) ,N ,+ , , , ; ,[empty] ,[empty] , , , ,[empty] ,BLACK ,[empty] ,[empty]	Black	10
4	GMZZ00	SCREW MACHINE	GMZZ0017701	1.4 mm,3.0 mm,MSWR3 ,N ,+ , - ,	Silver	11,62,64
4	GMZZ01	SCREW MACHINE	GMZZ0023501	1.4 mm,1.5 mm,MSWR3(FN) ,B ,+ , - , , ; ,[empty] ,[empty] , , , ,[empty] ,SILVER ,[empty] ,[empty]	Silver	63,70
4	GMZZ02	SCREW MACHINE	GMZZ0023601	1.4 mm,3.75 mm,MSWR3(BK) ,N ,+ , - , , ; ,[empty] ,[empty] , , , ,[empty] ,BLACK ,[empty] ,[empty]		61
4	MBJA00	BUTTON,DIAL	MBJA0022401	COMPLEX, (empty), , , , ,	Without Color	32
4	MCCH00	CAP,SCREW	MCCH0100901	COMPLEX, (empty), , , , ,	Silver	20
4	MDAY00	DECO	MDAY0035401	CASTING, Zn Alloy, , , , ,	Silver	8
4	MGAD00	GASKET,SHIELD FORM	MGAD0131001	COMPLEX, (empty), , , , ,	Gold	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
4	MKAC00	KEYPAD,FUNCTION	MKAC0009001	COMPLEX, (empty), , , ,	Without Color	5
4	MLAC00	LABEL,BARCODE	MLAC0003401	EZ LOOKS(user for mechanical)	Without Color	
4	MPBJ00	PAD,MOTOR	MPBJ0040801	COMPLEX, (empty), , , ,	Black	16
4	MPBZ00	PAD	MPBZ0183101	COMPLEX, (empty), , , ,	Black	
4	MPBZ01	PAD	MPBZ0170101	COMPLEX, (empty), , , ,	Black	60
4	MPBZ02	PAD	MPBZ0182201	COMPLEX, (empty), , , ,	Black	72
4	MPBZ03	PAD	MPBZ0182301	COMPLEX, (empty), , , ,	Black	59
4	MRAA00	RAIL,SLIDE	MRAA0004801	COMPLEX, (empty), , , ,	Aluminum Silver	71
4	MTAB00	TAPE,PROTECTION	MTAB0166101	COMPLEX, (empty), , , ,	Without Color	1
4	MTAB01	TAPE,PROTECTION	MTAB0166201	COMPLEX, (empty), , , ,	Without Color	7
4	MTAC00	TAPE,SHIELD	MTAC0044801	COMPLEX, (empty), , , ,	Blue	
4	MTAZ00	TAPE	MTAZ0192001	COMPLEX, (empty), , , ,	Without Color	
4	MWAC00	WINDOW,LCD	MWAC0073501	COMPLEX, (empty), , , ,	Without Color	2
6	ADCA00	DOME ASSY,METAL	ADCA0060201		Without Color	33
3	GMEY00	SCREW MACHINE,BIND	GMEY0009201	1.4 mm,3.5 mm,MSWR3(BK) ,B ,+ ,HEAD D=2.7mm	Black	69
3	MCCH00	CAP,SCREW	MCCH0097401	MOLD, Urethane Rubber S195A, , , ,	Without Color	52
3	MLAK00	LABEL,MODEL	MLAK0006301	LG (30.5x21.5 4-1R)	Pearl White	
5	MCBA00	CAN,SHIELD	MCBA0012801	PRESS, STS, , , ,	Silver	36
6	MPBZ00	PAD	MPBZ0180401	COMPLEX, (empty), , , ,	Black	
5	MCBA01	CAN,SHIELD	MCBA0012901	PRESS, STS, , , ,	Silver	39
6	MGAD00	GASKET,SHIELD FORM	MGAD0132601	COMPLEX, (empty), , , ,	Gold	
6	MSAZ00	SHEET	MSAZ0044001	COMPLEX, (empty), , , ,	Silver	
5	MTAZ00	TAPE	MTAZ0186701	COMPLEX, (empty), , , ,	Without Color	65
5	MLAZ00	LABEL	MLAZ0038301	PID Label 4 Array	Without Color	



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### <Main component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No	Description	Part Number	Spec	Color	Remark
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0022601	3.0 ,-2.0 dB,, ,bluetooth, internal ,; ,SINGLE ,-2.0 ,50 ,3.0		44
4	ESQY00	SWITCH,ROTARY	ESQY0000801	1 V,1 A,VERTICAL ,1 G,		9
4	SACY00	PCB ASSY,FLEXIBLE	SACY0054601	Slide LCD FPCB		14
5	SACB00	PCB ASSY,FLEXIBLE,INSERT	SACB0034801	Slide LCD FPCB		
6	MSAZ00	SHEET	MSAZ0042501	COMPLEX, (empty), , , ,	Without Color	13
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0049301	Slide LCD FPCB		
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0029401	Slide LCD FPCB		
7	C601	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C602	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
7	CN602	CONNECTOR,FFC/FPC	ENQY0012201	35 PIN,0.3 mm,ETC , ,H=1.0		
7	D601	DIODE,TVS	EDTY0008604	SOT-563 ,6 V,100 W,R/TP ,PB-FREE		
7	LD601	DIODE,LED,CHIP	EDLH0011901	WHITE ,1608 ,R/TP ,PB-FREE(ZENER)		
7	LD602	DIODE,LED,CHIP	EDLH0011901	WHITE ,1608 ,R/TP ,PB-FREE(ZENER)		
7	R601	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
7	U601	IC	EUSY0311501	,4 PIN,R/TP ,1.8X1.2 size Hall IC for FD JOG Dial		
7	U602	IC	EUSY0311501	,4 PIN,R/TP ,1.8X1.2 size Hall IC for FD JOG Dial		
7	VA601	VARISTOR	SEVY0003602	5.6 V , ,SMD ,1005 ,60pF		
7	VA602	VARISTOR	SEVY0003602	5.6 V , ,SMD ,1005 ,60pF		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0040201	Slide LCD FPCB		
7	C603	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	CN601	CONNECTOR,BOARD TO BOARD	ENBY0023701	54 PIN,0.4 mm,ETC , ,H=0.9, Socket		
5	SACB00	PCB ASSY,FLEXIBLE,INSERT	SACB0034901	Key FPCB Ass'y		
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0029501	Key FPCB Ass'y		
7	C502	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
7	C503	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
7	CN501	CONNECTOR,BOARD TO BOARD	ENBY0017201	70 PIN,0.4 mm,STRAIGHT ,AU ,FEMALE		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0040301	Key FPCB Ass'y		
7	C501	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
7	C504	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
7	C505	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
7	C506	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C507	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C508	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C509	CAP,CERAMIC,CHIP	ECCH0005604	10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP		
7	C511	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C512	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C513	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C514	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C515	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
7	C516	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C517	CAP,CERAMIC,CHIP	ECCH0005604	10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP		
7	C519	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
7	CN502	CONNECTOR,BOARD TO BOARD	ENBY0023601	54 PIN,0.4 mm,ETC , ,H=0.9, Header		
7	D501	DIODE,TVS	EDTY0008604	SOT-563 ,6 V,100 W,R/TP ,PB-FREE		
7	KB_CAM	SWITCH,TACT	ESCY0004201	12 V,0.02 A,HORIZONTAL ,0.2 G,		
7	L501	INDUCTOR,CHIP	ELCH0010402	270 nH,M ,1005 ,R/TP ,CHIP		
7	L502	INDUCTOR,CHIP	ELCH0010402	270 nH,M ,1005 ,R/TP ,CHIP		
7	L503	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
7	L504	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
7	LD501	DIODE,LED,CHIP	EDLH0013701	WHITE ,ETC ,R/TP ,SIDEVIEW ,; ,[empty] ,2.9~3.75 ,30mA , , ,120mW ,[empty] ,[empty] ,2P		
7	LD502	DIODE,LED,CHIP	EDLH0013701	WHITE ,ETC ,R/TP ,SIDEVIEW ,; ,[empty] ,2.9~3.75 ,30mA , , ,120mW ,[empty] ,[empty] ,2P		
7	LD503	DIODE,LED,MODULE	EDLM0008601	WHITE ,1 LED,2.0*1.5*0.45 ,R/TP ,PB-FREE		
7	MIC501	MICROPHONE	SUMY0010508	PIN ,42 dB,4*4 ,SMD Bridge Type		
7	Q501	TR,BJT,NPN	EQBN0013701	EMT6 ,150 mW,R/TP ,DUAL TRANSISTORS		
7	R501	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
7	R502	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
7	R503	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
7	R504	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
7	R505	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
7	R507	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
7	R508	RES,CHIP	ERHY0003601	2700 ohm,1/16W ,J ,1005 ,R/TP		
7	R509	RES,CHIP,MAKER	ERHZ0000410	12 ohm,1/16W ,J ,1005 ,R/TP		
7	R512	RES,CHIP,MAKER	ERHZ0000346	7500 ohm,1/16W ,F ,1005 ,R/TP		
7	R513	RES,CHIP,MAKER	ERHZ0000294	5100 ohm,1/16W ,F ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
7	U501	IC	EUSY0295501	TQFN , PIN,R/TP ,6 BLU+2 LDO+1 Flash LED Drv, 4*4		
7	VA503	VARISTOR	SEVY0004001	18 V ,SMD ,3pF, 1005		
7	VA504	VARISTOR	SEVY0004001	18 V ,SMD ,3pF, 1005		
6	SPCY00	PCB,FLEXIBLE	SPCY0088201	POLYI , 0.28mm,3-1-3 RF ,KE/ME970 KEY FPCB ,; , , , , , , , , , ,		35
4	SJMY00	VIBRATOR,MOTOR	SJMY0008404	3 V,80 mA,10*2.7 , ; ,3V ,55mA , ,12000 , , , ,		17
5	ELCH00	INDUCTOR,CHIP	ELCH0004711	22 nH,J ,1005 ,R/TP ,		
5	ELCH01	INDUCTOR,CHIP	ELCH0005807	5.6 nH,S ,1005 ,R/TP ,		
5	ENWY00	CONN,RF SWITCH	ENWY0003901	,SMD , dB,		
5	ERHZ00	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
5	SNGF00	ANTENNA,GSM,FIXED	SNGF0022501	3.0 ,-2.0 dBd,, ,internal, GSM900/1800/1900 ,; ,TRIPLE , - 2.0 ,50 ,3.0		31
4	SUSY00	SPEAKER	SUSY0024101	ASSY ,8 ohm,88 dB, mm, ; , , , , ,750 ,18*10*3T ,WIRE		15
4	SVLM00	LCD MODULE	SVLM0021001	MAIN ,240*320 ,37.9*53.9 ,262k ,TFT ,TM ,HM15CP200 ,		12
3	SAFY00	PCB ASSY,MAIN	SAFY0179902			
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0064701			
5	SVCY00	CAMERA	SVCY0012801	CMOS ,MEGA ,2M AF (FPCB, 1/4", SOC2020)		37
5	SWCC00	CABLE,COAXIAL	SWCC0003901	91 mm,2 LINE , ; ,[empty] ,[empty] ,[empty] , ,WHITE , ,[empty]		40
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0101102			
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0081801			
6	BAT301	BATTERY,CELL,LITHIUM	SBCL0001701	2 V,0.5 mAh,CYLINDER ,Reflow type BB, Max T 1.67, phi 4.8, Pb-Free		
6	C101	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C102	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C103	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C104	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C105	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C106	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C107	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C108	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C109	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C110	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C111	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C112	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C113	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C114	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C115	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C116	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C119	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C120	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C121	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C122	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C123	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C124	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C125	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C126	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C127	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C128	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C129	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C130	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C131	CAP,CHIP,MAKER	ECZH0001211	220 nF,10V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C132	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C133	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C134	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C135	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C136	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C137	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C138	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C139	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C140	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C201	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C202	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C203	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C204	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C205	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C206	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C207	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C208	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0009514	10 pF,25V ,D ,X7R ,HD ,0603 ,R/TP		
6	C210	CAP,CERAMIC,CHIP	ECCH0009506	27 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0009508	47 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C212	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C215	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C217	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C221	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C224	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C225	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C226	CAP,CERAMIC,CHIP	ECCH0005604	10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP		
6	C227	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C228	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH0005604	10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP		
6	C230	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C232	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C233	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C234	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C241	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C242	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C243	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C244	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C245	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C246	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C247	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C248	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C249	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C301	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C302	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C303	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V ,J,NP0,TC,1005,R/TP		
6	C308	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0009504	18 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C316	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C318	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C319	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C320	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C321	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C323	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C324	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C325	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C326	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C327	CAP,CERAMIC,CHIP	ECCH0009506	27 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C328	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C329	CAP,CERAMIC,CHIP	ECCH0009110	22 nF,6.3V ,K ,X7R ,TC ,0603 ,R/TP		
6	C330	CAP,CERAMIC,CHIP	ECCH0009514	10 pF,25V ,D ,X7R ,HD ,0603 ,R/TP		
6	C331	CAP,CERAMIC,CHIP	ECCH0009110	22 nF,6.3V ,K ,X7R ,TC ,0603 ,R/TP		
6	C332	CAP,CERAMIC,CHIP	ECCH0009506	27 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C334	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C335	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C336	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C337	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C338	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C339	CAP,CERAMIC,CHIP	ECCH0009106	10 nF,16V ,K ,X7R ,TC ,0603 ,R/TP		
6	C340	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C341	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C343	CAP,CHIP,MAKER	ECZH0000803	2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C344	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C345	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C346	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C347	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C349	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C401	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C402	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C403	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	CN201	CONNECTOR,ETC	ENZY0019401	3 PIN,3.0 mm,ETC , ,H=5.3		
6	CN302	CONNECTOR,BOARD TO BOARD	ENBY0017301	70 PIN,0.4 mm,STRAIGHT ,AU ,MALE		
6	CN303	CONNECTOR,I/O	ENRY0006501	18 PIN,0.4 mm,ETC , ,1.2 Offset		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	D301	DIODE,TVS	EDTY0008604	SOT-563 ,6 V,100 W,R/TP ,PB-FREE		
6	FB201	FILTER,BEAD,CHIP	SFBH0001003	220 ohm,2012 ,		
6	FL302	FILTER,EMI/POWER	SFEY0012901	SMD ,TDFN,100Ohm & 15pF / 15kV		
6	FL303	FILTER,EMI/POWER	SFEY0012901	SMD ,TDFN,100Ohm & 15pF / 15kV		
6	FL304	FILTER,EMI/POWER	SFEY0012901	SMD ,TDFN,100Ohm & 15pF / 15kV		
6	FL305	FILTER,EMI/POWER	SFEY0012901	SMD ,TDFN,100Ohm & 15pF / 15kV		
6	FL306	FILTER,EMI/POWER	SFEY0012901	SMD ,TDFN,100Ohm & 15pF / 15kV		
6	FL308	FILTER,DIELECTRIC	SFDY0001601	2450 MHz,2.0*1.25 ,SMD ,Pb-free_Bluetooth_Dielectric		
6	L101	INDUCTOR,CHIP	ELCH0010402	270 nH,M ,1005 ,R/TP ,CHIP		
6	L102	INDUCTOR,CHIP	ELCH0010402	270 nH,M ,1005 ,R/TP ,CHIP		
6	L103	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L104	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L201	INDUCTOR,SMD,POWER	ELCP0005104	10 uH,M ,3.8*3.8*1.8 ,R/TP ,power inductor/ 850mA		
6	L304	INDUCTOR,CHIP	ELCH0001411	1.2 nH,S ,1005 ,R/TP ,PBFREE		
6	L305	INDUCTOR,CHIP	ELCH0001411	1.2 nH,S ,1005 ,R/TP ,PBFREE		
6	Q301	TR,BJT,NPN	EQBN0007101	EMT3 ,0.15 W,R/TP ,LOW FREQUENCY		
6	R101	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP		
6	R102	RES,CHIP	ERHY0009517	22 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R103	RES,CHIP	ERHY0009522	3.3 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R104	RES,CHIP	ERHY0000166	390 Kohm,1/16W ,F ,1005 ,R/TP		
6	R105	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R107	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R108	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R109	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R110	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R112	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R113	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R115	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R116	RES,CHIP	ERHY0009522	3.3 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R117	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R118	RES,CHIP	ERHY0009535	24 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R121	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R122	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R202	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R203	RES,CHIP	ERHY0011901	47 mohm,1/4W ,F ,2012 ,R/TP		
6	R204	RES,CHIP	ERHY0009518	220 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R205	RES,CHIP	ERHY0009517	22 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	R210	RES,CHIP	ERHY0000278	82K ohm,1/16W,J,1005,R/TP		
6	R220	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R222	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R302	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R303	RES,CHIP	ERHY0009515	220 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R304	RES,CHIP	ERHY0009503	100 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R305	RES,CHIP	ERHY0009515	220 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R307	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R309	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R310	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R311	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R312	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R320	RES,CHIP	ERHY0009507	1 Mohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R321	RES,CHIP	ERHY0009524	47 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R322	RES,CHIP	ERHY0009518	220 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R324	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R325	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R326	RES,CHIP	ERHY0009527	47 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R328	RES,CHIP	ERHY0009516	2.2 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R329	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R330	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R334	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R337	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R401	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R402	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	U101	IC	EUSY0302101	BGA ,105 PIN,R/TP ,1G Nor+256MSDRAM, 1 8V I/O(Sibely)		
6	U103	IC	EUSY0274601	BGA ,293 PIN,R/TP ,EDGE BASE BAND S-GOLD2		
6	U201	IC	EUSY0286901	SOT23-5 ,5 PIN,R/TP ,2.5V Sense voltage(max), current monitor		
6	U203	IC	EUSY0269101	PG-VQFN-48 ,48 PIN,R/TP ,PMIC, Pb Free		
6	U204	IC	EUSY0304401	DFN ,10 PIN,R/TP ,2.8V/3.3V 300mA Dual LDO		
6	U306	IC	EUSY0250501	SC70 ,5 PIN,R/TP ,Comparator, pin compatible to EUSY0077701		
6	U401	IC	EUSY0279801	SC70 ,6 PIN,R/TP ,Dual Buffer, Pb Free		
6	VA301	VARISTOR	SEVY0003602	5.6 V , ,SMD ,1005, 60pF		
6	VA302	VARISTOR	SEVY0004001	18 V , ,SMD ,3pF, 1005		
6	VA303	VARISTOR	SEVY0004001	18 V , ,SMD ,3pF, 1005		



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	VA305	DIODE,TVS	EDTY0009101	SOD-923 ,5 V,150 mW,R/TP ,1.0*0.6*0.4		
6	VA306	DIODE,TVS	EDTY0009101	SOD-923 ,5 V,150 mW,R/TP ,1.0*0.6*0.4		
6	X101	X-TAL	EXXY0018701	32.768 KHz,20 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9		
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0080601			
6	C213	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C235	CAP,CERAMIC,CHIP	ECCH0007801	4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C236	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C240	CAP,TANTAL,CHIP,MAKER	ECTZ0004203	68 uF,6.3V ,M ,STD ,3216 ,R/TP		
6	C250	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C251	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C252	CAP,CHIP,MAKER	ECZH0003202	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C254	CAP,CERAMIC,CHIP	ECCH0009506	27 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C255	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C256	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C257	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C258	CAP,CERAMIC,CHIP	ECCH0009506	27 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C259	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C260	CAP,CHIP,MAKER	ECZH0003121	68 nF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C261	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C263	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C264	CAP,TANTAL,CHIP,MAKER	ECTZ0006301	100 uF,4V ,M ,L_ESR ,3216 ,R/TP		
6	C265	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C266	CAP,TANTAL,CHIP,MAKER	ECTZ0006301	100 uF,4V ,M ,L_ESR ,3216 ,R/TP		
6	C267	CAP,CHIP,MAKER	ECZH0001210	470 nF,10V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C268	CAP,CHIP,MAKER	ECZH0001211	220 nF,10V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C269	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C270	CAP,CHIP,MAKER	ECZH0003121	68 nF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C271	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C305	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C306	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C307	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C313	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C314	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C315	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C322	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C333	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C342	CAP,TANTAL,CHIP,MAKER	ECTZ0000318	33 uF,10V ,M ,STD ,3216 ,R/TP		
6	C348	CAP,CERAMIC,CHIP	ECCH0005602	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C404	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C405	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C407	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C408	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C409	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C413	CAP,TANTAL,CHIP,MAKER	ECTZ0004203	68 uF,6.3V ,M ,STD ,3216 ,R/TP		
6	C414	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C415	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C416	CAP,CERAMIC,CHIP	ECCH0004906	2.5 pF,50V ,C ,X7R ,TC ,1005 ,R/TP		
6	C417	CAP,CERAMIC,CHIP	ECCH0004906	2.5 pF,50V ,C ,X7R ,TC ,1005 ,R/TP		
6	C418	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C419	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C420	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C421	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C422	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C423	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C424	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C425	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C427	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C428	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C429	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C433	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C434	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C435	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C436	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C437	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C438	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C439	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C440	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C441	CAP,CERAMIC,CHIP	ECCH0009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C442	CAP,CERAMIC,CHIP	ECCH0009505	22 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C444	CAP,CHIP,MAKER	ECZH0003202	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C445	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C446	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		

Level	Location No	Description	Part Number	Spec	Color	Remark
6	CN202	CONN,SOCKET	ENSY0017901	14 PIN,ETC , ,2.54 mm,Micro-SD, UIM Dupli Socket		
6	CN301	CONNECTOR,BOARD TO BOARD	ENBY0015601	34 PIN,0.4 mm,STRAIGHT ,AU ,0.9MM HEIGHT		
6	CN401	CONN,RF SWITCH	ENWY0004001	,SMD ,1.3 dB,		
6	D201	DIODE,SWITCHING	EDSY0017701	SOD-123 ,40 V,1 A,R/TP ,,,,[empty] ,[empty] ,2P ,1		
6	FB301	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB302	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB303	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB304	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FL401	FILTER,SEPERATOR	SFAY0009001	850.900 ,1800.1900 ,3.5 dB,3.5 dB, dB, dB,ETC ,5.4X3.2X1.2 Size, Quad FEM		
6	L301	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L302	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L303	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L401	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
6	L402	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE		
6	L403	INDUCTOR,CHIP	ELCH0001402	18 nH,J ,1005 ,R/TP ,Pb Free		
6	L404	INDUCTOR,CHIP	ELCH0001036	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L405	INDUCTOR,CHIP	ELCH0001036	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	PT401	THERMISTOR	SETY0006301	NTC ,10000 ohm,SMD ,1005, 3350~3399k, J, R/T, PBFREE		
6	Q201	TR,FET,P-CHANNEL	EQFP0008301	TSOP-6 ,1.14 W,-30 V,-3.7 A,R/TP ,P-Channel FET		
6	Q202	TR,FET,P-CHANNEL	EQFP0004501	SOT-323 ,.29 W,1.8 V,.86 A,R/TP ,P-Chanel MOSFET, Pb free		
6	R209	RES,CHIP	ERHY0009560	33 Kohm,1/20W(0.05W) ,F ,0603 ,R/TP		
6	R211	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R212	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R213	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R214	RES,CHIP	ERHY0009526	4.7 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R215	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R216	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R217	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R218	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R219	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R221	RES,CHIP	ERHY0000715	0.15 ohm,1/8W ,F ,2012 ,R/TP		
6	R223	RES,CHIP	ERHY0009524	47 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R224	RES,CHIP	ERHY0009503	100 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R225	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	R226	RES,CHIP	ERHY0009524	47 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R227	RES,CHIP	ERHY0009524	47 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R228	RES,CHIP,MAKER	ERHZ0000522	24 ohm,1/16W ,J ,1005 ,R/TP		
6	R229	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R230	RES,CHIP	ERHY0009527	47 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R231	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R232	RES,CHIP,MAKER	ERHZ0000522	24 ohm,1/16W ,J ,1005 ,R/TP		
6	R233	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R234	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R235	RES,CHIP	ERHY0009503	100 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R236	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R237	RES,CHIP	ERHY0009526	4.7 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R238	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R239	RES,CHIP	ERHY0009511	1.5 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R240	RES,CHIP	ERHY0009502	10 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R241	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R242	RES,CHIP	ERHY0009502	10 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R243	RES,CHIP	ERHY0009526	4.7 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R244	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R306	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R313	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R314	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R315	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R319	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R323	RES,CHIP	ERHY0009511	1.5 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R404	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R405	RES,CHIP,MAKER	ERHZ0000412	1200 ohm,1/16W ,J ,1005 ,R/TP		
6	R406	RES,CHIP	ERHY0000101	0 ohm,1/16W,F,1005,R/TP		
6	R407	RES,CHIP	ERHY0000101	0 ohm,1/16W,F,1005,R/TP		
6	R408	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R409	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R410	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R411	RES,CHIP	ERHY0000185	820 ohm,1/16W ,F ,1005 ,R/TP		
6	R414	RES,CHIP	ERHY0009517	22 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R415	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R416	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R419	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	R420	RES,CHIP,MAKER	ERHZ0000501	620 ohm,1/16W ,J ,1005 ,R/TP		
6	R421	RES,CHIP	ERHY0009502	10 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R422	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R423	RES,CHIP	ERHY0009501	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R424	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R425	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R426	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R427	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	SPFY00	PCB,MAIN	SPFY0136901	FR-4 ,0.8 mm,STAGGERED-10 , , , , , , , , , ,		38
6	SW401	CONN,RF SWITCH	ENWY0002304	STRAIGHT ,SMD ,0.8 dB,MUSE MODEL		
6	U202	IC	EUSY0292601	DFN ,8 PIN,R/TP ,Li-ion charger IC, 8 Ld 2 x 3 DFN, Pb-free		
6	U205	IC	EUSY0300101	WQFN ,10 PIN,R/TP ,Small package Dual SPDT analog Switch, PB-Free		
6	U206	IC	EUSY0314501	QFN ,16 PIN,R/TP ,		
6	U207	IC	EUSY0309801	Output capless audio subsystem with 3D ,24 PIN,R/TP ,NS subsystem audio amp		
6	U208	IC	EUSY0300101	WQFN ,10 PIN,R/TP ,Small package Dual SPDT analog Switch, PB-Free		
6	U302	IC	EUSY0160401	SOT-23 ,3 PIN,R/TP ,DC MOTOR DRIVER / INTEGRATED RELAY		
6	U304	IC	EUSY0319201	DFN ,10 PIN,R/TP ,OVP		
6	U402	PAM	SMPY0012301	dBm, %, A, dBc, dB, ,SMD ,		
6	U403	IC	EUSY0274801	VQFN ,40 PIN,R/TP ,GPRS, EDGE TRANSCEIVER		
6	VA201	VARISTOR	SEVY0004001	18 V ,SMD ,3pF, 1005		
6	X401	VCTCXO	EXSK0005603	26 MHz,2 PPM,10 pF,SMD ,3.2*2.5*0.9 ,2.5ppm at -20 to +75, AFC 0.5V to 2.5V, Supply 2.6V		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.3 Accessory

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No	Description	Part Number	Spec	Color	Remark
3	SBPL00	BATTERY PACK,LI-ION	SBPL0085703	3.7 V,800 mAh,1 CELL,PRISMATIC ,CMW PJT BATT, Innerpack, Europe Label, Pb-Free ,; ,3.7 ,800 ,0.2C ,PRISMATIC ,43x34x46 , ,ALLTEL SILVER ,Innerpack ,CMW Slide & Folder	AIRY BLUE	55
3	SGDY00	DATA CABLE	SGDY0010901	LG-US03K ,18pin USB DataCable		
3	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0005526	; ,40mW ,16 OHM ,100dB ,F0 ,10KHZ ,[empty] ,[empty] ,18P MMI CONNECTOR ,SILVER,LG MARK		
3	SSAD00	ADAPTOR,AC-DC	SSAD0021002	100-240V ,5060 Hz,4.8 V,0.9 A,CB & CE ,18pin plug		

## Note

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